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No VII. OF VOL. I., 1932. LONDON, SATURDAY, FEBRUARY 13, 1932. Pp. 120—Price 1s.

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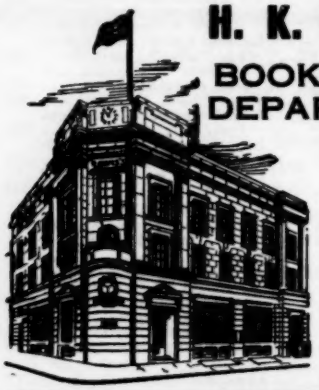

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ADDRESSES AND ORIGINAL ARTICLES

THE NATURAL HISTORY OF DUODENAL ULCER.*

BY JOHN A. RYLE, M.D., F.R.C.P. LOND.,
PHYSICIAN TO GUY'S HOSPITAL.

THE subject of this lecture is one which has engaged the thoughts of physicians and surgeons for a quarter of a century, but which still supplies them with unsettled problems. Mindful of the title of this office and of my inability to expound the anatomical or the surgical precepts of John Hunter, I have felt that I might at least, in humble fashion, demonstrate my devotion to the observational method of John Hunter the naturalist. The physician is or should be, above all, a student of the natural origins, associations, and sequences of disease, and in this capacity he can best render his contribution to prognosis and to therapeutic principle.

During the past 12 years I have had considerable opportunities of studying the problems of duodenal ulcer both at hospital and in the course of private practice. My close association with Dr. A. F. Hurst and his thorough methods of inquiry has furnished a constant stimulus, and I have been indebted to my friends, the surgeons and the radiologists for much instruction. Increasing familiarity with the disease has bred anything but contempt. Each year there have been new observations to record and new explanations to seek. The vast fund of information in the literature and the steady output of special researches on the subject notwithstanding, a broad review of the natural history of ulcus duodeni is, I believe, justified by the following four considerations:—

1. Duodenal ulcer is a prevalent disease, and there is evidence (although due allowance must be made for growth and concentration of population and for improvements in diagnosis) that this prevalence waxes rather than wanes under the existing conditions of civilised life.

An inquiry into the admission-rates of some common diseases at Guy's Hospital shows that, on the average, 100 cases of duodenal ulcer are admitted annually—that is to say, about 1 per cent. of all admissions—a figure somewhat less than the admission-rate for tuberculosis (all forms) but greater than that for all the pleurisies and lobar pneumonias combined. In addition, large numbers of cases are treated in the out-patient department. In my private practice, which has a general character—albeit with an abdominal bias—the ten most frequent diagnoses are duodenal ulcer, anxiety state, constipation, cholecystitis and gall-stones, hyperpiesia (with its cardiac and neurological sequels), tuberculosis, anæmia (all forms), migraine, spastic colon, and obesity. Of these, duodenal ulcer heads the list, accounting for approximately 5 per cent. of all my cases.

Wilkie,[1] stressing the steady increase in the cases of perforation at the Royal Infirmary, Edinburgh, in spite of improvements in diagnosis and treatment and a multiplication of the smaller hospitals capable of dealing with these catastrophes, reasonably argues that the total incidence of the disease is rising. At Guy's Hospital the same thing is to be observed. Dividing the period 1910–29 into four five-year periods the admission-rates for perforated duodenal ulcer are as follows:—

1910–1914	.. .. ..	48 cases
1915–1919 (war period)	..	29 ,,
1920–1924	.. .. ..	87 ,,
1925–1929	.. .. ..	115 ,,

A part of this increase may be due to the fact that surgeons have come to observe a better precision in locating ulcers with reference to the pyloric sphincter. The annual total of deaths from duodenal ulcer in England and Wales has almost doubled in the last decade (see below). It seems doubtful whether this increase can be wholly accounted for by such factors as growth of population, improved recognition, and better habits of precision in recording the site of the ulcer. Moreover, the deaths from gastric ulcer have shown a contemporary and parallel rise. In both cases the increase is much more conspicuous in the males.

2. Although the mortality of its most serious complication has been remarkably diminished by surgery duodenal ulcer continues to take its toll and remains, through painful dyspepsia and occasional hæmorrhage, a serious cause of disability and lost efficiency among members and classes of the community often endowed with energy and usefulness above the average and sometimes with outstanding ability.

3. Although of all the dyspeptic disorders duodenal ulcer presents the most clear-cut clinical picture, its leading characters and natural behaviour are not so widely appreciated in the profession as they might be.

Thus the length of time elapsing between first appearance of symptoms and diagnosis is usually to be reckoned in years rather than months. As the prospects of sound healing with a medical régime are best in the early days and diminish with the passage of time (vide Nielsen,[2] whose figures support the common experience of physicians), the prompt recognition of symptoms is an essential contribution to therapeutics. Except in the case of doctors or medical students, I rarely see a case with a history of only weeks or months. Among 184 cases of duodenal ulcer referred to me in which the length of history is recorded, there were only 52 in which this was two years or less. I have notes of 48 cases with histories of ten years and upwards, and of these 17 gave histories of 20 years or more, and a further five had had symptoms for at least 30 years. Among 121 cases (excluding cases of pyloric stenosis) in which the length of time between first symptoms and diagnosis could be roughly computed (all cases diagnosed in less than one year being counted as "immediate") *the average interval was seven years.*

4. Duodenal ulcer has supplied us with a number of problems in ætiology, prognosis, and treatment which are at present only partially solved.

Doubts and difficulties continue to confront us. The wavering from medical to surgical and back to medical opinion and the continued invention of new treatments and operations are eloquent of our uncertainty. Extravagant claims have been made from time to time by protagonists of both the medical and surgical schools. Bacteriology, biochemistry, minute anatomy, and statistical inquiry have, severally and collectively, failed to give the whole answer to our question. We have reached a point at which therapeutic experiment and specialised studies seem no more competent to give help in practice than a general survey of the active disease as it occurs and as it varies in living man.

To achieve such a survey with any completeness and within the compass of a single lecture would be an impossible task. I must therefore content myself with a condensation of experience and must ask to be excused lengthy references to the literature. All that is best of our knowledge of the subject is to be found in Moynihan's "Duodenal Ulcer" and in "Gastric and Duodenal Ulcer" by Hurst and Stewart. To the authors of these classics we must

* Hunterian lecture delivered before the Royal College of Surgeons of England on Feb. 8th.

always remain indebted. If my remarks provide some small stimulus to the further pursuit of the old observational method (and without the coöperation of this method experimental medicine can make but a halting advance), and if, in addition, I can adduce reasons for the adoption of a more judicial attitude in arranging the treatment of cases, I shall be well satisfied.

I have among my files the notes of upwards of 350 cases interrogated and examined by myself to which the diagnosis of duodenal ulcer is attached. From these I have separated for analysis only those in which the clinical story was confirmed by operation, hæmorrhage (generally melæna), or a reliable radiologist. This series comprises (*a*) 218 cases, of which 24 had proceeded to the development of pyloric stenosis. To these I have added (*b*) 35 cases of anastomotic ulcer, and (*c*) eight cases of other surgical disappointments following gastro-jejunostomy undertaken for the relief of a duodenal ulcer. My mental images are naturally coloured by an equivalent experience of hospital patients drawn from other sections of the community, but I have preferred to employ the material immediately to my hand and upon which all observations were intimate and personal.

The Origins of Duodenal Ulcer.

CONSTITUTION.

Wherein should we seek the beginnings of a disease which tends strongly to relapse or chronicity and which has no basis in contagion or epidemic causes? Clearly, I think, in the peculiarities and antecedents of its victims or in their habits and environment. Preoccupied with the lesion and with hypotheses as to its mode of initiation and perpetuation by local bacterial and chemical action we have too long delayed our study of the soil in which it thrives. We have but to observe in sufficient number our patients as they come before us to appreciate that we are here confronted with distinctive human types or constitutions. Within these constitutions we may already discern certain physical, biochemical, and psychological variants which between them supply what we may call the "ulcer diathesis." Thus, if our notes are sufficiently descriptive, we find again and again that our patients are delineated as "lean and nervous" men, often tense and muscular and with brisk mental and physical reactions, or, alternatively, as robust and energetic and, when free from symptoms, of strikingly healthy appearance. There are even physiognomical characters which may impel us to hazard the diagnosis before the history is taken, but, as the disease itself may put a stamp upon the features, we cannot here be sure that we are concerned with heritable variations. The epigastric angle is commonly wide, and the observations of Faber [3] have enabled us to correlate this feature with the short, high, "steerhorn" stomach of the radiologist. Moody, Van Nuys, and Chamberlain [4] find this type of stomach more common in the male sex. Campbell and Conybeare [5] have also associated this type of stomach with broad athletic men on the one hand and with hyperchlorhydria on the other. Izod Bennett [6] and I earlier reported hyperchlorhydric curves in 8 per cent. of healthy male students. Psychologically these folk are energetic, restless, conscientious, intent on their projects, and not seldom given to anxiety of mind. If engaged in business their city lunch is an occasion not for respite and digestion, but for more business. Recognition of these facts is essential to a proper understanding of the disease and to the handling of cases. No disease, however, should be summarily ascribed in any part to constitutional causes unless we can also demonstrate that it exhibits a familial tendency. Other chronic maladies like gout, asthma, and epilepsy have long been accepted as having some basis in constitutional causes and provide positive family histories in approximately 25 per cent. of cases. Occasional reports on the familial tendency of ulcer had appeared previously, but it was not until 1921 that Hurst,[7 8] who is so largely responsible for our reawakened interest in the constitutional factor, laid emphasis upon the real importance of inheritance in this disease. In his paper bearing on the subject he quoted among others three family histories which had then come to my notice, including one in which three brothers were operated on for duodenal ulcer and a sister for gastric ulcer. In my present series (*a*) there were 23 instances (10 per cent.) in which a near relative—i.e., parent, child, brother, sister, aunt, uncle, or first cousin—was recorded as having had a duodenal ulcer. In one instance the father of the patient, two uncles, and one cousin, and in another a sister and two maternal cousins had been afflicted. Histories of "dyspepsia" in near relatives are also common. If allowance be made for the infrequent recognition of duodenal ulcer as a cause of dyspepsia in the last and preceding generations, the frequency with which the diagnosis is missed at the present day, the customary inattention to the family history of a disease until its importance becomes widely accepted, and the difficulty always experienced in collecting and recording medical pedigrees, it seems probable that the actual incidence of positive family histories in duodenal ulcer would prove to be higher than these figures indicate.

SEX, AGE, AND OCCUPATION.

Sex.—The well-recognised preponderance of male over female cases (four to one in the present series) must also have some bearing on ætiology. The broad epigastric angle and steerhorn stomach are commoner in the male sex. The male of the type described spends his energies freely, often bolts or misses meals, often smokes excessively, and generally lacks the aptitude or opportunity for quiet in his life which falls more frequently to the lot of womankind.

Age.—The age-incidence of the disease is also instructive. Roughly half the cases are between the ages of 30 and 50, that is to say, within the period of life when work and worry most predominate. Duodenal ulcer is rare in childhood and, in fact, until after puberty, although occasional boyhood cases are to be found in any long series. It is rare for symptoms to make their first appearance after the sixth decade, although recurrences then and even into the seventies and eighties are not infrequent. The average age in my series at the time of consultation (excluding cases of pyloric stenosis) was 47 years. The youngest patient was aged 19, the oldest 83. The youngest calculated age of onset was 9 years, and there were others as young as 12 and 15. Positive family histories, as we should anticipate, appear to be more frequent in the youthful group.

Occupation.—The influence of occupation is hard to assess. No figures, for instance, are available for comparing the incidence of the disease in urban and agricultural communities. On a retrospect of experience it is difficult to avoid the conclusion that the life and occupations of the city are rather more productive of the disease. Among 94 cases in which the profession is recorded I find 28 doctors, 22 business men and lawyers, 13 officers of the Army, Navy, and

Air Force, 7 dentists, and 24 in other walks of professional life. Doctors and members of the fighting forces also appear to show a special liability according to Hurst's figures from New Lodge Clinic.[8] The missed and bolted meals, and the cares which come to interrupt the smooth course of his digestion, might well be advanced in part explanation of the medical man's apparent predisposition to the disease. Its occurrence in the Services is merely a reminder that the disease is one of robust or active rather than frail or indolent constitutions. Lord Moynihan[9] has recently referred to his experience of cases in athletes of the first rank.

OTHER ÆTIOLOGICAL FACTORS.

Tobacco.—Smoking had been indulged in by the men almost invariably and sometimes in great excess, but, although medical and surgical opinion unite in opposing the free use of tobacco by ulcer victims, and many patients appreciate that they are better without it, or even that it may aggravate symptoms, it is difficult to obtain concise proofs with regard to the part which this habit plays in determining the arrival or perpetuation of symptoms or the different incidence of duodenal ulcer in the two sexes.

Focal Sepsis.—Although it is a reasonable part of treatment to eradicate focal sepsis, and although the teeth or the appendix can often be shown to be unhealthy, the actual contribution of cryptic infections is still difficult to assess. Dental, tonsillar, and sinus infections are not necessarily followed by duodenal ulceration, even in persons predisposed by constitution or habits of life. Furthermore, duodenal ulcer may develop in patients in whom no focus can be found or who have long since been deprived of their teeth or vermiform appendix.

Environment.—I have referred to the possibility of a higher incidence of duodenal ulcer under the conditions of life in cities. With others I have also been struck by the promptly beneficent influence of a healthy out-of-door life on the active symptoms of the disease. A country holiday will frequently cut short an attack. Nervous influences play their part, for pain may cease on the first day of the holiday. One patient of mine could spend weeks ski-ing in the Austrian Alps, living on black bread and beer, without symptoms, but would relapse in his English home where his diet was carefully arranged. But more impressive than such isolated cases has been the story, repeated to me on several occasions, that men with duodenal ulcer, who were dyspeptics before their military service and again on their return to office life, were entirely free from symptoms under the hard physical conditions of active service abroad during the war.

Climate may also play some part. I have had patients who were free from symptoms in India but afflicted when at home, and Major E. B. Marsh, who made a particular study of duodenal ulcer among the troops at Aldershot, where he found it prevalent, later wrote to me from India to report that in 22 months in the East among British troops, differing only in that they were slightly older than the home troops, he had not seen a single proven case of ulcer.

Season, as Moynihan[10] showed long since, undoubtedly influences the fluctuations of the disease in the individual, winter, or autumn and spring recurrences being commonly described. Recurrences at these seasons or "in cold weather" were specifically entered in my notes in 25 cases (12 per cent.) of the duodenal ulcer series (*a*). Raw east winds are particularly obnoxious to sufferers from duodenal ulcer. Seasonal infections may be a factor, but the majority of patients do not remark on this association.

Mental States.—A restless stomach accompanies a restless mind. In many cases anxiety and mental conflict seem to play a part in the aggravation of symptoms. In a minority of cases (although it be beyond proof) it is tempting to wonder whether the disease would have developed in the absence of psychological turmoil.

Ætiological studies are thus shown to be of some importance, and if we can cast our vision forwards to a time in which we shall be more concerned with the prevention than with the cure of chronic diseases of this class it is clear that our method will find its basis quite as much in intimate studies of constitution, habits of life and environment, as in the refinements of chemistry, bacteriology, and animal experiment. In our choice of treatment of the active disease we must also remain attentive to these elements in its natural history, remembering that the success of therapeutic experiment in the long run depends even more upon knowledge and judgment than upon technique.

The Course of Duodenal Ulcer.

I have referred to the long interval which commonly elapses between first symptoms and diagnosis. The chief reason for this is to be found in the natural tendency to spontaneous remissions of symptoms. Patients and doctors alike in the first attack, delighted by the quick response to dietary care or "a bottle of bismuth," with disappearance of all pain within a period of two or three weeks or less, are lulled into an attitude of false security and deem the "bout of indigestion" past and done with. As Moynihan and others have clearly proclaimed, this behaviour is characteristic of the disease. If we are to judge by the early clinical course of duodenal ulcer (for symptoms surely bear some relationship to "activity") there must be repeated attempts at natural healing, and this is a particular justification for medical measures at this stage. That spontaneous healing occurs is evident from the scars found in the course of routine post-mortem work. The first attacks may last no more than ten days and rarely more than three or four weeks, and they may be followed by free intervals of enjoyable health, with ability to eat all foods, enduring for six months or longer. The man who starts his illness with a melæna is really a lucky man, for by this means his diagnosis is declared and early and strict treatment instituted. Many patients go free all the summer months and suffer relapses between October and March. With the passage of years the bouts of dyspepsia become more prolonged and frequent. And so the disease may drag on intermittently for five, ten, or even twenty years, with or without distinctive complications and often, in the latter event, without a diagnosis.

Hæmorrhage occurred at one stage or another in rather less than 40 per cent. of this series (*a*), but it should be recalled that many cases unconfirmed by operation, X rays, or hæmorrhage were excluded, so that the figure is clearly too high. Most authors of experience record hæmorrhage as occurring in approximately 25 per cent. of cases. Allowing for the many "missed" dyspeptic cases, all recorded percentage figures for the complications must be accepted as too liberal. Perforation (including "local perforations") occurred in ten cases of the duodenal ulcer series (*a*) and in the anastomotic ulcer series (*b*) (35 cases) in seven cases before and three after operation. These figures give no indication of the actual frequency of perforation. The physician is rarely

called to these emergencies. It is, however, a much rarer complication than hæmorrhage. Pyloric stenosis occurred in 24 (11 per cent.) of my cases series (*a*). The serious complication of involvement of the head of the pancreas, with its particular syndrome (to be described later) occurred in 2 per cent. of this series.

Mortality of Duodenal Ulcer.

It is impossible to estimate the death-rate of a disease so widespread and yet so ill-recorded as duodenal ulcer. Even allowing that the majority of deaths among patients of the hospital class occur in hospital we can obtain no accurate measure, for hospitals not only attract the cases of perforation and hæmorrhage in undue proportion, but also admit only the more serious of the dyspeptic cases. In 20 years at Guy's Hospital there have been 153 deaths among cases of duodenal ulcer. Of these, 70 followed perforation, 25 followed hæmorrhage, and the remainder were indexed as due to various secondary complications of perforation or of operation undertaken for the relief of the disease or of its complications, or to intercurrent disease. That is to say, in a hospital admitting about 100 cases a year, about seven or eight cases a year die from all causes. For every one of these 100 cases admitted to the wards there must be several others from the same communities treated as out-patients and in their homes, or remaining undiagnosed and untreated. In general, although its interruptions to health are numerous, the menace to life of a duodenal ulcer is not a very grave one. According to the Registrar-General's returns there were 1140 deaths (male) and 160 deaths (female) from duodenal ulcer in England and Wales during 1930, as compared with 552 (male) and 129 (female) in 1920. These figures are sufficiently arresting, and yet they must represent but a small percentage of the total army of recognised and unrecognised cases.

The Symptoms of Duodenal Ulcer.

Moynihan [10] has rightly insisted on the anamnesis as the main plank in the diagnosis of duodenal ulcer. This should include all proper inquiries into personal and family history, environment, occupation, and habits, for these may serve not only to complete the opinion, but also to balance judgment in therapeutic decisions. But above all our interrogations must deal intimately with subjective phenomena. In the majority of cases it should be possible to arrive at a diagnosis of duodenal ulcer from the history and symptoms alone, and before the physical examination or accessory measures, such as radiology and the test-meal, have been called upon to play their part.

The leading symptom is the pain. It is true that an ulcer may be present to the tune of "wind" or "acid vomiting" and that the patient may deny the occurrence of true pain, but this is not usual. Employing a method of pain-analysis which I have advocated elsewhere we may consider the pain of duodenal ulcer under ten headings having reference to (1) character; (2) severity; (3) situation; (4) localisation (or extent of diffusion); (5) paths of reference; (6) duration; (7) frequency; (8) special times of arrival; (9) and (10) aggravating and relieving factors. The character of the pain is described with great consistency as "gnawing" or, alternatively, as "aching" or "like a toothache." There is no intermission, although there may be slight fluctuations while it lasts. It is "wearing" and "worrying" but not so severe, as a rule, as to prohibit work, although it may hamper efficiency and concentration. With the occasional complication of pancreatic erosion it may, however, become very severe and even require morphine for its relief. Its situation is indicated by the patient with the finger-tips in mid-epigastrium or slightly to the right in more chronic cases; it is then generally at a lower level than that indicated by the right subcostal gesture of cholecystitis. It has a precise position and localisation, but in severe, old-standing cases, and especially when flatulence with ærophagy is pronounced, it may "spread" widely into the chest. When the pancreas is involved it "goes through" to the back at the same level and, occupying the region of the twelfth rib (appreciably lower than the subscapular reference of gall-bladder disease), it may even create a suspicion of a right renal lesion. In these cases, too, the anterior pain may be "right subcostal" rather than "epigastric." The pain is absent on waking, and remains in abeyance until some two to two and a half hours after breakfast. Arriving, let us say, at 11.30 A.M. it will persist for an hour or more or until relieved by lunch, but it may return again before tea and again in the evening. Rearrangements of diet or meals will modify the behaviour of the pain. In cases of long standing a special time of occurrence is 2 A.M., when it wakes from sleep and lingers for an hour or two unless assuaged by food, a warm drink, or medicine. It is aggravated by fasting, worry, fatigue, and cold, and sometimes by smoking. It is relieved by food, drink, warmth, rest, peace of mind, and alkalis. Delayed pain, first noted in 1828 by Abercrombie,[11] and the hunger-pain with relief by food so clearly portrayed by Moynihan (although they are occasionally due to other causes—i.e., gall-stones, appendicitis, gastric ulcer, worry, tobacco-excess, and very rarely carcinoma of the stomach) are thus the outstanding features of the disease.

We must not, however, neglect associated symptoms. With or without the pain an epigastric "sinking sensation," which probably represents an exaggeration of the normal gastric phenomena of hunger, is often mentioned. It is rare in other dyspepsias. Feelings of "flatulence" or of fullness or a "bursting sensation" may accompany or replace the pain. In all cases of dyspepsia with pronounced flatulence the time of arrival of the symptom should be determined. If this is before meals and food gives ease the possibility of duodenal ulcer (even in the absence of pain) must be seriously considered. The relief by eructation, and especially that which follows the use of bicarbonate of soda, suggests to the patient, and often to his doctor, that the case is "merely one of flatulent dyspepsia," but flatulent dyspepsia must have a cause, and when the flatulence is rhythmical and at its worst before meals this cause is often duodenal ulcer. The gas eructated is odourless except in the presence of pyloric stenosis when it may have the taint of sulphuretted hydrogen. Vomiting has been regarded as a rare symptom in duodenal ulcer without stenosis, but this requires qualification. Vomiting of food is, indeed, exceptional, but an acid watery vomit is common especially with the more chronic ulcers. If later the quantity of this watery vomit increases or food is mingled with it cicatricial stenosis should be suspected. Acid eructations which burn the throat and roughen the teeth are the only symptom, in my belief, of hyperchlorhydria and so may occur with duodenal ulcer, but they are not usual. Waterbrash, or the sudden filling of the mouth with tasteless watery saliva, sometimes with accompanying pain in the parotid glands, is more common and so characteristic of duodenal ulcer and so rare in other dyspepsias that it has genuine diagnostic value. One patient spontaneously and aptly described this symptom to me as "a beautiful action of Nature."

Waking, he said, at night with bad pain he would shortly find his mouth filling with water as fast as he could swallow it; as he did so the pain steadily faded away. Heartburn and nausea are not symptomatic of duodenal ulcer. Constipation, especially during the attacks, is a frequent complaint.

Apart from the local symptoms of the disease there are certain general complaints which are very real to the patient and sufficiently rare in other gastric disorders to be of definitive value. I would particularly mention a feeling of physical weakness or exhaustion which is coincidental with the pain and akin to feelings experienced in association with rectal spasm, excessive purgation, or other strong visceral crises. Mental irritability and loss of the power of concentration are also described and are evidence of the powerful nervous influences attendant on a visceral disturbance which carries with it, as well as pain, the psychic and physical phenomena of strong hunger. These symptoms also are relieved by food.

FACTORS WHICH INFLUENCE SEVERITY, CHARACTER, SITUATION OR FOOD RELATIONSHIPS OF THE PAIN.

It should be mentioned, for it is not as widely appreciated as it might be, that the degrees of physical disturbance in duodenal ulcer show wide variations. The physician sees many cases in which the very mildness of the symptoms has led to a postponement of diagnosis. The surgeon, no doubt, sees a higher proportion in which pain is outstanding and severe. The severity of the pain tends to increase with the chronicity of the ulcer. It increases at first with commencing stenosis, but later, as gastric dilatation supervenes upon hypertrophy, pain becomes less obtrusive and vomiting is the leading symptom. When the head of the pancreas is eroded by a posterior ulcer the pain is at times unbearably severe and in the presence of this complication I have seen courageous men reduced to exhaustion and tears. Apart from hæmorrhage it is the only symptom which the physician may be called upon to treat with morphine. It is worthy of note that hæmorrhage may immediately abolish pain. When bleeding is severe, confinement to bed, morphine, and abstention from food and later a strict dietary clearly explain the relief, but even slight and at first unrecognised bleeding with an ambulatory case will have the same effect. In this circumstance a patient who has been suffering dyspeptic pains may actually hold himself better as regards his ulcer and a failure to appreciate the significance of developing weakness and anæmia results. In the presence of early stenosis pain may become more "grinding" or "peristaltic" in quality. The situation of the pain commonly shifts to the right in the case of old-standing and adherent ulcers. The interval between food and pain diminishes in the early stages of pyloric stenosis and may be reduced to one or one and a half instead of the two or three hours previously experienced. It should also, however, be recognised that patients with extreme gastric "hurry" occasionally show a very short food-pain interval. With ulceration involving the head of the pancreas all clear relationship to food tends to disappear and alkalis may cease to be effective.

Objective Signs.

In the absence of pyloric stenosis with gastric dilatation or the rare discovery of a palpable inflammatory tumour it is too widely assumed that duodenal ulcer is a disease without physical signs. If carefully sought for, superficial, or more commonly deep cutaneous soreness, an increased abdominal reflex, muscular guarding, and deep tenderness—all confined to the right upper quadrant of the abdomen—will be found either singly or in various combination in a high proportion of cases. These signs are more likely to be found with anterior ulcers, during stages of activity, and when pain is actually present. They disappear with healing. An increased reflex and muscular guarding are both more common than cutaneous hyperalgesia. Very occasionally a pilomotor reflex (goose-skin) confined to the same area may be observed when eliciting the abdominal reflex. The vasomotor consequences of active pain are sometimes manifest in the facies. Thus near relatives describe pallor or "greyness" coincident with suffering in chronic cases. Phosphaturia is so common in association with active duodenal ulcer that I have come to expect a milky urine at the time of consultation in the majority of cases. How far it is related to the taking of alkalis or not I have been unable to determine. Loss of weight is seldom conspicuous in uncomplicated cases.

Complications and Sequelæ.

Hæmorrhage and perforation, cicatricial stenosis and anchorage of the ulcer-base to the head of the pancreas are the important complications. To these we must add the unsuccessful gastro-jejunostomy which, under modern conditions, has been a sufficiently frequent sequel to justify its inclusion in a study of the natural history of duodenal ulcer, and, in a retrospective way, may even help to illuminate the disease.

With the symptoms of hæmorrhage and perforation I shall not especially concern myself for they are well known. Hæmorrhage, as stated, occurs in about one-quarter of the recognised cases. In many of my cases there was a history of two or more hæmorrhages; 107 patients (series *a* and *b*) between them had 151 hæmorrhages. Two patients, aged 76 and 56, died of gastric uræmia (alkalosis) with coincident hæmorrhage, in one case following an operation. One, aged 56, died of coincident hæmorrhage and cellulitis of the arm. One, aged 36, was transfused on account of a severe hæmorrhage from a chronic ulcer, had an immediate reaction and succumbed. Three cases, aged 76, 72, and 26, died of hæmorrhage alone. The older the patient, the longer the history and the more severe the tale of dyspeptic symptoms, the more seriously should an hæmorrhage be regarded, for the more likely in this event is it that the ulcer is deep and that a large vessel is eroded. In the case of bleeding with slight or recent dyspeptic symptoms or without previous dyspepsia and in young subjects, the prognosis can usually be reassuring. In my solitary fatal case in a young man there was a long history of very severe pain with a posterior reference which had led me, a few days earlier, to a diagnosis of pancreatic erosion. The total mortality from hæmorrhage is small. There were 25 deaths from this cause during 20 years at Guy's Hospital as compared with 128 deaths from other causes. The association of pyrexia with recent hæmorrhage is worthy of mention. As Hurst[8] concludes it is probably due to retention of blood in the bowel, for it subsides when the bowel is clear. In one case of mine, a severe hæmorrhage occurred but without hæmatemesis or melæna. The bowels did not move for several days and the combination of high fever and acute anæmia had, not unnaturally, caused doubts as to the correct opinion.

As indicated no idea of the incidence of perforation can be obtained from this series. There were 10 cases (series *a*), including cases of local perforation which did not lead to immediate operation. Approximately one-fifth of the cases of duodenal ulcer admitted to Guy's Hospital are for a perforation, but clearly

this is the complication above all others which necessitates institutional treatment. The likelihood of perforation is greatest in the early stages of the disease and diminishes with the passage of time.

The classical symptoms of established pyloric stenosis (which is generally a sequel of duodenal rather than prepyloric ulceration) include voluminous vomiting of food taken many hours, or even days previously and loss of weight. The late physical signs include a visible stomach "standing out" on the abdominal wall, visible peristaltic movements from left to right and succussion splash at a time when the stomach should be empty. It should, however, be possible to diagnose the condition before such striking symptoms and signs appear and chiefly from the past history and an alteration in the time and character of the pain and palpability of the hypertrophied organ. Eructations of sulphuretted hydrogen have been regarded as especially significant of obstruction by a pyloric carcinoma, but I have recorded them more frequently in benign stenosis. They are not necessarily a late manifestation. They were mentioned in eight of my 24 cases. If eggs and protein foods have been excluded from the diet they do not occur.

There is an important, if occasional, syndrome of pyloric stenosis in which general symptoms predominate. This has been described as "gastric uræmia." There were three examples among my 24 cases. The symptoms include drowsiness and irritability or stupor often leading to a fatal coma and are held to be due to an alkalosis such as occurs with the vomiting of high intestinal obstruction or excessive dosage of alkalis. The blood-urea is raised, sometimes markedly so. Vomiting need not necessarily be excessive. Operative risk is increased, and yet if the condition is recognised in time a short-circuit after suitable preparation (including routine lavage) is indicated. Every case of pyloric stenosis should have a blood-urea estimation prior to operation as the operation and anæsthetic may precipitate the symptoms. Treatment with alkalis is contra-indicated in the presence of organic stenosis and renal deficiency. There were no cases of tetany in this series. I have encountered altogether five cases of "gastric uræmia" complicating duodenal or pre-pyloric ulceration. Four ended fatally, and in two the diagnosis was only made at necropsy. The third patient, an elderly subject, who had previously undergone prostatectomy, was also bleeding and was too ill to warrant operation. The fourth was noticed to be mentally peculiar before an operation under-taken for pyloric stenosis and was anæmic from slight hæmorrhage; the true cause of the mental change was overlooked, he became comatose and died shortly after the operation. The fifth case showed no symptoms until after the operation but recovered.

A case of pyloric stenosis with "gastric uræmia" (alkalosis).—A man, aged 51 (sent by Dr. Bernard Haigh), had had "stomach trouble" all his life and was treated medically for duodenal ulcer 20 years previously. Eight years previously he was operated on for a perforated duodenal ulcer, but had never been really well since. He complained of hunger-pain, but had also started voluminous vomiting of acid-fluid with a little food. I noted visible peristalsis. His blood pressure was 200/120; the urine occasionally contained a trace of albumin. After confirmation of the diagnosis in hospital a gastro-jejunostomy was performed by Mr. P. Turner. Almost immediately after the operation he became restless, mentally deranged, and then stuporose. His blood-urea figure was 112 mg. per 100 c.cm., or nearly four times normal. He was treated with sedatives and rectal salines and made a complete recovery.

The average duration of ulcer symptoms in 16 of my cases of pyloric stenosis was 17 years. Only two cases gave histories of five years or less.

INVOLVEMENT OF THE PANCREAS.

The duodenum is doubtless anchored to the pancreas by adhesions in many cases of posterior ulcer. In a small number the base of the ulcer may become more firmly welded to this organ or may actually erode it. In this event a clinical syndrome develops which is characterised by pain of unusual severity, not responding to strict medical treatment and alkalis, and even requiring morphine for its relief. The pain is commonly in the right upper quadrant and referred through to the right loin and may be chiefly felt posteriorly. Biliary and renal calculus are therefore sometimes wrongly diagnosed. Glycosuria occurs in some cases, and I have seen it come and go with the ulcer symptoms. The diagnosis is occasionally missed by expert radiologists in these cases, partly, I believe, because, with firm fixation of the duodenum, the prepyloric antrum is thrust over to the right during peristaltic activity, and so obscures the first part of the duodenum altogether. I have also seen cases in which a posterior adherent duodenal ulcer had escaped detection at operations undertaken for the relief of an ulcer or with a view to discovering the cause of pain.

A case of posterior duodenal ulcer involving the pancreas.—Major A., a fine old soldier, aged 73, suffered for many years from periodic bouts of dyspepsia with pain arriving some hours after food and relieved by it. Later the pain became greatly intensified and less clearly related to meals. He saw a surgeon who diagnosed gall-stones and, in spite of a negative cholecystography, operated for gall-stones. Finding no stones he drained the gall-bladder. During convalescence there was melæna on two occasions. The pain continued as before, and in his worst attacks, which took place at night, was sometimes so severe as to make him weep; it was accompanied by involuntary tremors and shivering. I saw him in pain and it was a pitiful spectacle. The pain was referred to the level of the eleventh and twelfth ribs on the right side posteriorly and there was guarding with tenderness over the right upper rectus. I diagnosed "posterior duodenal ulcer involving the pancreas." The radiologist reported "appearances strongly indicative of an ulcer of the stomach about half-way between the cardia and the pylorus." Mr. L. Bromley operated and found no gastric lesion but a posterior duodenal ulcer firmly welded to the head of the pancreas. A gastro-jejunostomy was performed and all symptoms were completely relieved.

ANASTOMOTIC ULCER.

For every ten cases of duodenal ulcer referred to me I see one case of anastomotic ulcer. This gives no indication of the frequency of this sequel, for it is evident that surgical "failures" find their way to the physician just as medical "failures" find their way to the surgeon. The sequel, however, is a serious one and sufficiently common to justify careful inquiry into its causes and the greatest caution in the selection of cases for a gastro-jejunostomy.

The development of ulceration at or near the stoma has been variously attributed to faulty technique, unabsorbable sutures, the failure to eradicate focal sepsis, and neglect of appropriate after-care. My own experience suggests that more important than any of these are a faulty judgment in the selection of cases for operation and the presence of a strong constitutional predisposition. There was a positive family history in seven out of my 35 cases of anastomotic ulcer (*b*), twice the rate of incidence in the duodenal ulcer series (*a*). The age at onset of the ulcer-symptoms for which the operation was undertaken was under 20 years in six cases and in three of these there was a positive family history. Early appearance of a chronic disease more usual in later decades should always suggest constitutional predisposition. I have notes of two cases of anastomotic ulcer in which I had myself advised the short-circuit. In the first the patient's father had had ulcer symptoms, although

ulcer was never definitely diagnosed, and the patient himself started life with congenital pyloric stenosis. The second patient was a highly nervous and restless man, continually preoccupied with financial cares. His symptoms had recurred in spite of strict medical treatment. He developed vicious cycle vomiting soon after the operation together with signs of a local peritonitis. Unsuitable temperament and technical flaw here conspired to bring about the bad result.

In 12 cases the symptoms of duodenal ulcer had been present for only a year or less before the operation, and in four others for two or three years only. In six cases there had been symptoms for ten years or more. The remainder were of intermediate or indeterminate duration. It is difficult to avoid the impression (which these records and my hospital experience support) that short-circuits in the case of young persons and short histories are unsound. It is clear enough that the conditions in either case are remotely removed from those which originally justified the operation—namely, an established obstructive lesion.

In 12 cases of anastomotic ulcer there was a history of hæmorrhage prior to the operation and in nine of these the operation was apparently undertaken largely on account of this symptom. Of the 12 cases which had bled before operation eight bled again after it. Of 23 cases which had not bled before operation ten bled subsequently. On the experience of these cases and hospital work I incline to the view that hæmorrhage should not be regarded in itself as an indication for gastro-jejunostomy. Seven cases of anastomotic ulcer gave a history of perforation before operation. Three of these perforated again afterwards.

Recurrence of ulcer symptoms was noted in a year or less in 19 cases; in two years in 2 cases; in three years in 3 cases; in four years in 1 case; in five years in 2 cases; in six years in 1 case; in seven years in 1 case; in nine years in 2 cases. In four cases the interval was not recorded.

The symptoms of anastomotic ulcer are very similar to those of the original duodenal ulcer. There is hunger-pain with more or less relief by food. Both immediate and lasting relief of symptoms, however, even with the strictest medical care, is much less certainly attained than in the case of duodenal ulcer. Furthermore, pain and distress tend to be more severe and lasting. Hæmorrhage may occur without premonitory pain. The most constant physical sign is a point of tenderness just above and to the left of the navel. Anastomotic ulcers are liable to the same leading complications as duodenal ulcer—namely, hæmorrhage, perforation, and stenosis. The most wretched and often fatal complication is a gastro-jejuno-colic fistula of which the symptoms are pain, eructation of "bowel-wind," or even vomiting of fæces, diarrhœa, anæmia, and emaciation. Fortunately it is rare. I have had two cases under my care in hospital but none in private practice. Hamilton Fairley and Kilner have recently reported on cases showing fatty diarrhœa with a megalocytic anæmia.[12]

OTHER COMPLICATIONS OF THE SHORT-CIRCUIT.

The most important remaining complication is "vicious cycle vomiting," which is characterised by attacks of copious bilious vomiting at irregular intervals with or without pain. The "dumping stoma," in which the common complaint is of a fullness and discomfort around and below the navel developing soon after meals and due to rapid over-filling of the small gut, is inconvenient but less crippling.

THE PROSPECTS OF OTHER OPERATIONS AND MEDICAL TREATMENT.

It is too early to assess the later results of alternative operations such as gastro-duodenostomy, resection, and excision. Only after some 20 years are we learning to view in correct perspective the advantages and disadvantages of gastro-jejunostomy, and if we are wise we shall not too trustfully accept the promises made on behalf of the newer experiments. That they do not always succeed is already apparent. That they will often fail in the presence of strong constitutional predisposition or with injudicious selection of cases seems to me probable. Medical treatment carried out for a sufficient length of time, at rest and in accordance with physiological principles and with proper control and careful subsequent "handling," remains our only alternative. Here the best results are naturally obtained with early cases, and the onus lies upon those first responsible for diagnosis. With ulcers of long standing there is often grateful relief, but there are limits to lasting success, extravagant claims are not justified, and the same judicial care must be employed in the selection of cases. But, whereas a surgical failure often leaves the patient in far worse plight than before, the same cannot be said of medical failures. Surgical treatment has been claimed as an insurance against grave complications, such as perforation and hæmorrhage, but the study of post-operative histories shows this insurance to be of limited reliability.

Conclusion.

The naturalist customarily pursues his task for his own instruction and intellectual pleasure and with a view to enlarging the general stores of knowledge. The physician, as naturalist, is actuated by the same motives and, in addition, by the desire to improve treatment for humane ends. It is necessary, therefore, in stating my conclusions, to indicate anything of practical utility which may be held to emerge from a review of the natural history of duodenal ulcer in all its stages. What we chiefly need in practice to-day is some surer guidance in the grouping and management of cases. My present policy, based on experience, of which I have here given a partial account, is to advise gastro-jejunostomy in cases of pyloric stenosis; in cases of long-standing duodenal ulcer in which clinical history, X rays, and test-meal proclaim gross scarring or anchorage and a tendency to slow transit of food without serious stasis, and in which there has been recurrence in spite of one or more strict courses of medical treatment; in cases presenting the syndrome of anchorage to or erosion of the pancreas; and in cases of concomitant duodenal ulcer and duodenal ileus, where, again, there is an obstructive factor at work obviating sound healing by mechanical unrest and increasing the likelihood of perforation by increased intraduodenal pressure (as I have once successfully foretold).[13] My policy is to oppose surgical treatment in youthful cases; in non-obstructive cases with short histories and adverse pedigrees or not previously accorded a strict medical treatment; in cases with recent hæmorrhage, lacking other indications; and in cases in which X ray and test-meal show gastric "hurry," for here to accelerate emptying still further and to attempt an anastomosis in the presence of exaggerated motor and chemical unrest is to create just those conditions which may be held to favour secondary ulceration. Highly nervous individuals and elderly subjects should often be deemed unsuitable for surgery, even when the only alternative is continuous medical and dietary care. Economic and environmental factors must at times

compel a modification of general policy. Surgical treatment should always be followed by a period of strict medical treatment and proper precautions thereafter. Psychological as well as physical requirements must be carefully studied.

All surgeons and physicians who undertake the treatment of this troublesome disease must endeavour to preserve the studious attitude, not lightly accepting opinion or submitting to the bias of their craft, and remembering always that they are not, in fact, concerned with duodenal ulcer the lesion, but with duodenal ulcer the disease, as it occurs and as it varies in individuals of special type and temper and differing daily circumstance. In each case, briefly, judgment must be based, not upon the presence of an ulcer, but upon a proper understanding of the whole patient and the whole disease.

As I have sought to show, duodenal ulcer has general effects on the body and the mind as well as general causes in them, and no effect or cause can be neglected.

In a restless and fretful age which has largely lost the old simplicities of diet and conduct the most important contribution which we can make to the prophylaxis of duodenal ulcer is to furnish, as opportunity arises, sensible instructions to the community (and particularly to such families or individuals as manifest a constitutional or occupational predisposition to the disease) with regard to the evils of missed and bolted meals, of excessive smoking, and of the prevalent habit of attempting to combine the process of digestion with anxiety and affairs. It is not extravagant to suppose that a cup of hot milk at 11 A.M. and bedtime would save many a harassed doctor or business man endowed with the diathesis from developing the disease.

The most important contribution which we can make to the therapeutics of duodenal ulcer is, by observing subjective symptoms, to ensure much earlier diagnosis, and, by observing the entire disease and the qualities of its victims, to achieve a wiser balance in our choice of method.

It is, I believe, a just criticism of surgery and medicine in the present era that they have concentrated on parts to the exclusion of the whole and on technique to the exclusion of philosophy. In duodenal ulcer no less than in many other maladies, we have come to rely upon too narrow a pathology. In our therapeutic quests we have been too little observant of physiological principle. We are all compelled by the magnitude of our subject to be something of specialists, but this should not necessitate an abandonment of that naturalistic outlook which marked the achievement of our old preceptors from Hippocrates to Hunter.

I am indebted to Mr. H. L. Eason, superintendent of Guy's Hospital, for access to the hospital records and to Mr. J. F. Mackridge for making the necessary extracts from these records.

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TWO CASES OF LYMPHOGRANULOMATOSIS MALIGNA,

ONE WITH INVOLVEMENT OF THE VERTEBRAL PERIOSTEUM.

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With a commentary by

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CASE 1. *Lymphogranulomatosis maligna with extension to the spinal canal.*—The patient, a married woman aged 31, was in good health until 14 months before her death. Her illness began with "influenza," cough, and general pruritus, and she was admitted to Guy's Hospital, where glandular enlargement was found and a diagnosis of Hodgkin's disease with pulmonary tuberculosis was made. After six months the glands began to enlarge rapidly, and later she was admitted to the East Anglian Sanatorium, under the care of Dr. Jane Walker, and transferred to the Elizabeth Garrett Anderson Hospital, under D. C. H.

Past history.—She had noticed a small gland on the right side of the neck in 1926, but this had soon disappeared. She had probably contracted phthisis from her husband, who died in 1925 of that disease.

Symptoms and clinical signs (September, 1930).—She complained chiefly of severe pains down the arms, and of pruritus; she became dyspnœic on slight exertion. The cervical glands formed a massive collar completely deforming the neck and extending downwards under the clavicles; the axillary glands were enlarged, but no enlarged glands were detected elsewhere. A gland removed by biopsy showed typical lymphogranulomatosis maligna. The spleen was not palpable and the liver not enlarged. There was weakness and muscular wasting of the arms and hands, the reflexes were retained, and there was no sensory change; the lower limbs and sphincters were not affected. There was a paroxysmal cough and pain in the chest, the sputum contained tubercle bacilli, there was extensive dullness at both apices, and crepitations on the left side. There was continuous, irregular swinging fever up to 101° F. Nothing abnormal was noted on examination of the other systems. Radiographic examination showed enlargement of the intrathoracic glands with pressure on the trachea. Wassermann and sigma reactions were negative.

A *diagnosis* of lymphogranulomatosis maligna with involvement of the vertebral periosteum was made by Dr. Parkes Weber, who saw the case in consultation.

Course of illness.—Treatment was given by X rays over the right side of the neck with a view to relieving the pressure pains; no definite change in the glands was noted, but the pain was distinctly lessened. The effect of the treatment on the lymphocyte count is shown in the Table. The patient became gradually weaker and died on Dec. 1st, 1930. Autopsy was performed on the same day.

Post-mortem report (E. H. L.).—Lymphatic glands and metastatic growths. Very numerous enlarged glands are present on both sides of the neck and in the axillæ, the glands round the lower jaw are discrete, and shell out as the connective tissue is incised; those in the lower part of the neck are matted together and form dense masses; the adjacent connective tissue is very œdematous. These glands have to be cut away from the periosteum, to which they are adherent on the anterior and lateral aspects of the lower cervical and upper dorsal vertebræ. In the second, third, and fourth intercostal spaces on the right side are small white nodules of growth lying beneath the pleura, close to the spine. On the dorsal aspect of the thorax a nodule of growth is present embedded in the muscle between the spine and the scapula; the nodule measures $1\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$ in. On removing the spinous processes a sheet of growth is exposed in the spinal canal, coming upwards on each side of the dura and almost meeting in the mid-line on the

TABLE SHOWING BLOOD EXAMINATIONS (BY D. M. VAUX).

Date	Sept. 19.	—	Oct. 3.	Oct. 6.	Oct. 9.	Oct. 14.	—	Oct. 22.	Nov. 7.	Nov. 19.
Hæmoglobin percentage ..	48		—	—	—	—		—	—	66
Colour-index	0·54		—	—	—	—		—	—	0·56
Red cells per c.mm.	4,460,000	X ray	—	—	—	—		—	—	5,900,000
White cells ,, ...	18,800	treatment twice weekly from Sept. 30.	24,500	36,000	28,200	26,100	X ray treatment stopped Oct. 17.	22,800	24,300	19,400
Differential Counts.										
Polymorphonuclears per cent.	75·5		91	88·5	88·5	79		91·5	90	92
,, per c.mm.	14,100		22,295	31,860	24,597	20,619		20,862	21,850	17,848
Lymphocytes per cent... ..	22		6	4·5	5	8		3	3	3
,, per c.mm. ..	4,163		1,470	1,620	1,410	2,088		684	729	582
Hyalines per cent.	1·5		3	7	6	11		4·5	5	4·5
Eosinophils ,, ...	1		0	0	0·5	2		1	2	0·5

dorsal aspect of the cord. It extends for 5 inches from C. 7 above to D. 5 below. It is infiltrating the fatty tissue in the canal and the periosteum, and involves the bone in the region of the fourth and fifth dorsal spines; it extends round the anterior aspect of the canal and passes through the intervertebral foramina with the nerve roots; it is densely adherent to the periosteum. The cord is œdematous but firm. In the abdominal cavity the lymphatic glands are moderately enlarged; there is no extension of growth from the aortic glands to the periosteum of the spine.

The spleen weighs 10¼ oz.; on section it shows several large, firm, yellowish-white nodules from 1 to 2 in. in diameter. The nodules are veined with brown pigment; the intervening tissue appears normal. Liver, kidneys, suprarenals, and pancreas appear normal. There is no enlargement of lymphoid follicles in the alimentary canal. The right pleural cavity contains two pints of muco-pus; there are extensive tuberculous lesions in both upper lobes; the glands are enlarged at both hila.

Histological appearances.—In the large glands the normal structure has entirely disappeared; there are thick strands of fibrous tissue enclosing islands composed of Sternberg cells, lymphocytes, polymorphonuclear and eosinophil leucocytes, and plasma cells; areas of necrosis are present. Localised nodules of typical lymphogranulomatous tissue are present in the spleen, the nodules are surrounded by fibrous tissue, in the outer layer of which is a deposit of brown pigment giving the Prussian-blue reaction; the splenic tissue between the nodules appears normal. A section from the posterior aspect of the dura where the growth is infiltrating the laminæ shows the typical appearances of lymphogranulomatosis. A section from the anterior aspect of the dura is composed almost entirely of small cells with round, deeply staining nuclei arranged in groups in a somewhat hyaline connective tissue stroma. A very few typical Sternberg cells can be found in some places, but plasma cells and polymorphonuclear cells are absent. The appearances resemble an endothelioma. A section of a nodule from an intercostal space, however, showed a combination of these appearances, so that a diagnosis of endothelioma could be excluded, and the common origin of the morbid process established.

FIG. 1 (Case 1).

Semi-diagrammatic drawings of the upper part of the spinal cord, showing the lymphogranulomatous tissue lying on the external surface of the dura. A, anterior, and B, posterior, aspect. (Drawings by W. Thornton Shiells.)

The liver, kidneys, suprarenals, and pancreas show no changes.

CASE 2. *Lymphogranulomatosis maligna with predominant lesions in the spleen and alimentary canal.*—The patient was a married woman, aged 48. She first attended the Elizabeth Garrett Anderson Hospital in 1923 for chronic indigestion, and two years later was admitted for a large hæmatemesis, from which she made a good recovery. Enlargement of lymphatic glands occurred in 1924 in the neighbourhood of the right parotid; these were removed in 1924 and again in 1925; there was no further recurrence in this situation; a small mass was removed from the left posterior triangle in 1929. No enlargement of glands in other situations and no enlargement of the spleen was reported at this time. In January, 1930, considerable splenic enlargement was present, but the general health was fairly good. In July she was admitted to the hospital. She complained of severe epigastric pain, aggravated by the taking of food; the tongue was sore.

Examination.—She was pale and thin, and the spleen formed a prominence on the left side of the abdomen, the lower pole being 1½ in. below the umbilicus; the liver was slightly enlarged. The glands were palpable in the neck, axillæ, and groins, but appeared to be normal. There was no pruritus. The heart, lungs, and nervous system were normal.

Special investigations.—A fractional test-meal on July 24th showed complete achlorhydria. A blood count on July 21st showed 40 per cent. hæmoglobin; a colour-index of 0·5; 4·65 million red cells; and 3500 white cells per c.mm. Another on August 25th showed hæmoglobin percentage of 60; a colour-index of 0·7; 4·98 million red cells; and 4400 white cells per c.mm. The differential white cell count was: polymorphonuclears, 77·5; lymphocytes, 9·5; hyalines, 8·5; eosinophils, 4·0; and basophils, 0·5 per cent. The red cell fragility was normal; the van den Bergh indirect reaction was positive; small amounts of urobilinogen were present in the urine. The Wassermann and sigma reactions were negative.

Histological examination of glands removed by operation in 1925 and 1929 (E. H. L.).—The largest and smallest glands all show the same appearances. No normal gland structure remains: it is replaced by small closely packed cells having round or oval nuclei. There is no evidence of active cell division. There is some increase in the endothelial cells, but no typical Sternberg cells and no eosinophil cells are present. There are a few very small areas of necrosis in the larger glands.

Clinical diagnosis.—This was a matter of great difficulty, as the glands removed by biopsy gave no clear histological picture. The diagnoses considered were splenic anæmia, tuberculosis, and Hodgkin's disease. Dr. Parkes Weber, who saw the case in consultation, was of opinion that the balance of evidence was in favour of the last diagnosis. The presence of achlorhydria is of interest, but it was probably secondary to the invasion of the stomach by the disease.

Course of illness.—During 11 weeks in hospital she suffered increasingly from pain, vomiting, and diarrhœa with blood in the vomit and stools. The temperature was

irregular, the maximum being 100° F. Death occurred on Oct. 2nd, 1930, and an autopsy was held next day.

Post-mortem report (D. M. Vaux).—There is a chain of glands on both sides of the neck; the largest measures 1 × ½ in. They are discrete, firm, pale, and homogeneous. The axillary glands are moderately enlarged, the bronchial and mediastinal glands very slightly enlarged. There is enlargement of the mesenteric glands and of those along both curvatures of the stomach, round the cœliac axis, and along the whole length of the aorta and iliac vessels; The glands are discrete. There is localised peritonitis in the region of the stomach and spleen, and a small perforation in the middle of the anterior wall of the stomach, shut off by adhesions to the under surface of the liver. The surrounding area of the stomach is covered with blood and is necrotic. There are scattered irregular patches on both anterior and posterior walls of the stomach; the wall is firm and thickened in these areas, and the mucous membrane over them is raised, yellowish, and beginning to ulcerate. The small intestine appears atrophied, Peyer's patches are thickened, and the solitary follicles enlarged. The mucous membrane for half an inch above the ileo-cæcal valve is thickened and papilliferous. The large intestine throughout shows patches of thickened mucous membrane, especially in the cæcum and proximal end of the appendix.

The spleen weighs 33 oz. There is perisplenitis, and the organ is adherent to the stomach and is very firm. The tissue on section is deep red, and closely set in parts with bluish-white nodules of the size of a pin's head; there are also "hard-bake" nodules at or near the surface. The liver is large, pale, and firm; its surface is smooth. On section it shows fatty change and diffuse white areas of growth round the portal fissure and passing into the liver substance along the lines of the vessels. No nodules are seen.

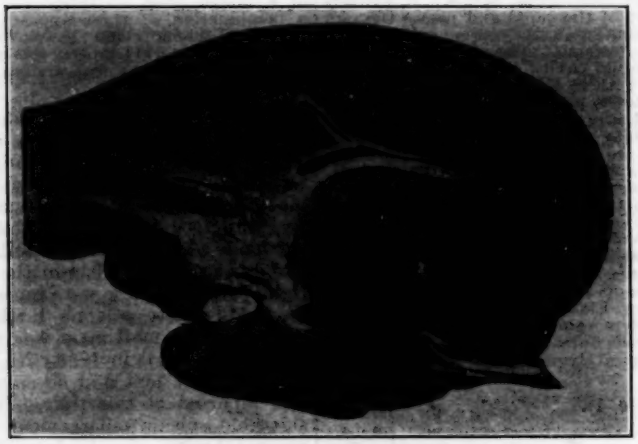
The kidneys, suprarenals, pancreas, and spinal canal are normal.

Histological examination (E. H. L.).—The glands of the neck show complete fibrosis, but no changes are to be detected in the thoracic glands. In the large abdominal glands no normal structure remains. There is a diffuse growth consisting of small cells having round or oval nuclei; there is considerable fibrosis and some necrosis, and a few isolated cells resembling Sternberg cells can be found (after prolonged search three typical multinucleated cells occurring together were discovered). There is marked fibrosis of the spleen, but no necrosis. Amyloid degeneration is present in the walls of the arteries. The changes are very advanced, and no typical lymphogranulomatous structure is found. There is a diffuse infiltration of the liver, spreading from the hilum along the vessels; this consists of small cells with round or oval nuclei and of polymorphonuclear leucocytes, but no Sternberg cells can be found. The infiltration is followed by very marked fibrosis, which has led to small areas of necrosis. There is marked fatty degeneration, but no amyloid change.

In the stomach wall there is marked infiltration of the mucous membrane and submucosa with lymphocytes and polymorphonuclear leucocytes; there is also considerable fibrosis which has obstructed the vessels and caused large areas of necrosis. The cæcum and colon show similar changes.

The marked involvement of the alimentary canal suggested at first that this was a case of lymphosarcoma (Turnbull [1]). A comparison of the histology with that of Case 1, however, leaves little doubt that the two cases are varieties of the same disease, though in Case 2 the lymphocytic type of cell predominates to the exclusion of the typical appearances. In Case 1, tissues were found showing every degree of change, from the typical Sternberg eosinophil granuloma to a growth composed of closely packed small cells exactly similar in appearance to those found in Case 2.

FIG. 2 (Case 2).



Section of liver, showing fatty infiltration and diffuse white areas of growth round the portal fissure and passing into the liver substance along the lines of the vessels. The section passes through one of the glands in the hilum.

COMMENTARY (F. P. W.).

The first period of the illness in Case 1 appears fairly classical. The occasional association of tuberculosis with lymphogranulomatosis maligna has long been recognised; the cause of the connexion may be explained in different ways in different cases, but it should be remembered that the former disease is common, and the latter not exceedingly rare. Cutaneous pruritus often accompanies lymphogranulomatosis, especially in the earlier stages, sometimes constituting the chief symptom and occasionally leading to a kind of pruriginous dermatitis, and even to a generalised itching erythrodermia. In this case the most remarkable feature was the involvement of the vertebral periosteum, which doubtless caused the pains and paræsthesiæ in the shoulders and upper limbs. These sensory symptoms had led to a diagnosis during life of vertebral periosteal involvement.

In 1923 [2] and in 1926 [3] I described and collected accounts of cases of lymphogranulomatosis complicated by paraplegia or cauda equina symptoms and vertebral involvement, and since then various similar cases have been published.[4] It is clear that in a typical case of lymphogranulomatosis maligna, after the disease has run an ordinary course for a longer or shorter time, the ventral vertebral periosteum may become infiltrated and this infiltration may spread to the periosteum lining the vertebral canal and to the epidural fat, thus giving rise to pains and to paraplegia from the irritation and compression of the nerve roots and spinal cord.

From a necropsy in 1927 [5] it becomes probable that if the spinal column and epidural space were systematically examined in every fatal case of lymphogranulomatosis, even when no nervous symptoms had been recorded during life, lymphogranulomatous infiltration would be found to be more frequent than hitherto suspected.

But why does the vertebral periosteum become infiltrated in some cases, while in most cases it remains uninvolved? I suggest that in this case the periosteum became infiltrated through direct contact with lymphogranulomatous glands in which infiltration of the extracapsular connective tissue was in active progress. Dr. Lepper, in her report, mentions that the diseased lymph glands were matted together and formed dense masses, and had to be cut away from the

vertebral periosteum. Looking back on my first case (a young man under hospital treatment from 1919 to 1921), I find that the lymphogranulomatous infiltration of the vertebral periosteum and epidural fat was associated with much involvement of the abdominal lymph glands, notably those about the vertebral column.[6] There can be no doubt that occasionally the lymphogranulomatous process extends beyond the capsules of the glands so as to invade the surrounding extracapsular tissue. O. Naegeli[7] mentions a case which on that account was formerly supposed by Dietrich to be one of lymphosarcoma. In a hospital patient of mine, aged 54 years, who died from lymphogranulomatosis maligna in January, 1915, the abdominal aorta near its bifurcation was found partially embedded in a hard, whitish growth, doubtless formed by the lymphogranulomatous transformation and matting together of para-aortic glands so as to form a firm fibroid mass.

Dr. C. P. Symonds has recently suggested that the lymphogranulomatous process may extend intracranially as it sometimes does into the intervertebral canal.[8]

Case 2 is especially interesting on account of the very extensive involvement of the alimentary canal, and the macroscopically remarkable infiltration of the liver along the lines of the great vessels; and even more so on account of the clinical and histological diagnosis between lymphosarcomatosis and lymphogranulomatosis maligna and the possible relationship between them. It should be noted that lymphosarcoma, as Turnbull[1] sees it, including many cases in which the spleen and liver are affected, is very different in its distribution from lymphosarcoma, as originally described in 1893 by the Viennese pathologist, Kundrat[9]; Naegeli[10] still follows Kundrat in regard to lymphosarcomatosis when he writes: "Wenig und oft gar nicht beteiligt sind Milz und Leber." I would suggest that the term "lymphosarcoma," or, when multiple, "lymphosarcomatosis," includes two diseases:—

(1) The lymphosarcomatosis of Kundrat and Naegeli, which is apparently a neoplastic disease, originating in the lymphoblastic elements of the affected lymphadenoid tissue.

(2) A variety or phase of lymphogranulomatosis maligna or, as we still call it, Hodgkin's disease.

I suggest that Hodgkin's disease originates in the endothelial elements of the reticulo-endothelial portion of the first affected lymphatic glands, or other lymphatic structure, and afterwards tends to become generalised in other regions of the body. Whether it is really a granulomatosis or a neoplastic disease is not yet clear; if the former, it is probably due to a virus, but if it is a neoplastic disease, the morbid or reaction-producing "agent" must still be regarded as the neoplastic process ("urge") itself. The cells of neoplasms more or less continue to exercise the functions of the normal cells from which they originated. One of the normal functions of the endothelial cells in question is, probably, to produce or accumulate lymphocytes near them, and, in fact, the reticulo-endothelial elements together with the lymphoblastic elements constitute "lymphadenoid tissue." In some lesions the crowded lymphocytes tend to dominate the histological picture and make it resemble a lymphosarcoma, whereas in other lesions the Sternberg-Read-Andrewes histological cellular features are more characteristic. In the present case the mainly lymphocytic picture was associated with much fibrosis, just as the Sternberg-Read-Andrewes features generally are (as exemplified in the first case).

(*Continued at foot of next column.*)

AN INQUIRY INTO REFERRED PAIN.*

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Recently the hypothesis of Ross, Mackenzie, and Head regarding referred pain has been challenged by Morley[1] as the result of a series of prolonged and careful investigations. These investigations have led Morley to believe that pain resulting from visceral disease is referred to a somatic cutaneous area only when the parietal peritoneum is involved; he utilises the phrenic nerve as an example. Thus when the diaphragmatic region of the abdominal cavity is involved in a disease process, pain is referred to the region of skin supplied by the fourth cervical segment, mostly in the region of the outer end of the clavicle. It had recently been stated by Lemaire,[2] Weiss,[3] and others, that referred pain can be abolished by local anæsthetisation of the cutaneous area to which the pain is referred. If this be so, the theory of referred pain, which is generally accepted, is rendered still more insecure. In support of this, Morley publishes evidence that the referred pain in the shoulder from the diaphragm can be abolished by novocain injection of the shoulder area.

This aspect of the problem of referred pain appeared to us to be worthy of investigation, and we have made observations during the operation of phrenic avulsion under local anæsthesia. The operative procedure was to infiltrate with novocain and adrenalin a line across the neck about two fingers' breadth above the clavicle, so situated that it crossed the posterior border of the sternomastoid muscle.

* Observations communicated to the Medical Research Society at a meeting on Jan. 15th.

[1] Morley, J.: Abdominal Pain, Edinburgh, 1931.

[2] Lemaire: Rev. Méd. de Louvain, 1926, ix., 129.

[3] Weiss, S., and Davis, D.: Amer. Jour. Med. Sci., 1928, clxxvi., 517.

(*Continued from previous column.*)

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3. ,, ,, ,, : International Clinics, 1926, 36th Series, vol. i., p. 127.
4. East, C. F. T., and Lightwood, R. C.: The Lancet, 1927, ii., 807; Poynton, J. F., and Harris, K. E.: Ibid., 1930, ii., 903; Carslaw, J., and Young, J. S.: Glasgow Med. Jour., 1927, cviii., 193; Eugénis, C., Thèse de Lyon, 1929 (with many references); Schaeffer, H., and Horowitz, A.: Presse Méd., 1930, xxxviii., 403; see also communications by Cain, Rachet, and Horowitz at the Soc. Méd. des Hôp. de Paris on Dec. 6th, 1929, and by Boidin, Fayot, and Beinis at the same society on July 4th, 1930; also Joly's communication at another society (Abstr., Presse Méd., 1931, xxxix., 466); and a report on two cases by Lemaître, Muller, and Nuytten (Abstr. Presse Méd., 1932, xl., 170).
5. Weber, and Bode, O. B.: The Lancet, 1927, ii., 806.
6. Weber: Quart. Jour. Med., loc. cit. (ref. 2), Case 1.
7. Naegeli, O.: Blutkrankheiten, 3rd edit. (German), Berlin, 1919, pp. 521, 522.
8. Kisch, H.: Proc. Roy. Soc. Med., 1931–32, xxv. (Sect. Laryng.), 1.
9. Kundrat, H. K.: Wien. Klin. Woch., 1893, vi., 211 and 234.
10. Naegeli: Op cit. (ref. 7), 5th edit., 1931, p. 535.

Through an incision along this line the phrenic nerve was exposed and avulsed.

In all we have been present at nine such operations, and have made the following observations.

Firstly, the area of skin supplied by the third, fourth, and fifth cervical segments was investigated by pin-prick and by means of a soft camel-hair brush to ascertain that sensation was normal. The line of incision was then infiltrated and sensation again tested; it was thus established as to whether the anæsthesia was limited to the line of infiltration or included the supraclavicular nerves. The phrenic nerve was next exposed. By lightly pinching the exposed nerve pain was elicited, and the painful area mapped out. This area was then infiltrated subepidermally in some cases, subcutaneously in others, and both in still others. The nerve was again lightly pinched, and the painful area again mapped out. The nerve was then divided and both ends stimulated. In one or two cases the nerve was injected, then lightly pinched proximally and distally to the injection. Finally the nerve was avulsed.

The following experiment is illustrative of our findings in all.

G.i. (1) Preliminary tests showed that the skin over the right shoulder and cervical region was of normal sensitivity.
(2) Subcutaneous infiltration with novocain and adrenalin along the line of the intended incision caused only anæsthesia limited to the line of the incision.
(3) The phrenic nerve was exposed.
(4) It was lightly pinched, causing the patient to flinch and to complain of severe pain which was localised to an area of about the size of a shilling internal to the acromioclavicular joint.
(5) This area of referred pain was infiltrated in the subepidermal tissues with novocain and adrenalin; and this area on testing was found to be completely anæsthetic.
(6) The phrenic nerve was again lightly pinched; the patient flinched as before and referred the pain to a region slightly below and external to the previous point. The amount of displacement was not more than 1·0–1·5 cm.
Both areas corresponded to areas of reference as mapped out by Head.
(7) This area was further infiltrated and on testing proved to be anæsthetic. Pinching the phrenic consequent to this last infiltration again elicited pain which was on this occasion referred to the previous area of reference, though it was still an anæsthetic area.

Mr. Roberts has repeated these observations in many other cases and has constantly found the same phenomena.

In all nine cases similar results were obtained; in no case was the referred pain altered in character or intensity; in only two was a very small degree of shift determined, and such shift was easily explicable on the difficulty of localising accurately such pain. Stimulation of the distal end of the cut nerve caused no pain, while a stimulation of the proximal end invariably caused referred pain. Thus reference is only obtainable from the proximal end of the divided or blocked nerve. This latter point is of importance in excluding the possibility of the pain having been elicited by stimulation of the tissues around the phrenic nerve. Finally, all the cases on X ray examination following the operation exhibited paralysis of the diaphragm.

CONCLUSIONS.

(1) The diaphragm behaves as a viscus, since light compression of the phrenic nerve occasions no sensation referable to its anatomical site.

(2) On stimulation of the phrenic nerve ascending impulses occur which are felt as pain and are referred.

(3) The area of referred pain is almost identical in all subjects and belongs to the fourth cervical segmental distribution.

(4) Anæsthesia of the area of referred pain in no way affects the character or intensity of the referred pain, and that the locality of the referred pain, apart from the occasional slight shift already mentioned, is not altered. Thus the pain must be due to a reference by higher centres of activity arising in the spinal segment corresponding to the nerve stimulated.

One of us (E. A. C.) carried out this work while in receipt of a personal grant from the Medical Research Council.

THE LEUCOPOIETIC VALUE OF SULPHUR.

BY T. D. POWER, M.D. DUB., M.R.C.P. LOND., D.P.H., D.P.M.,
DEPUTY MEDICAL SUPERINTENDENT, BRENTWOOD MENTAL HOSPITAL.

FOR the past two years injections of sulphur in oil have been widely employed in the treatment of a variety of conditions, prominent among which are general paralysis of the insane and dementia præcox. The primary object of the therapy is to produce a series of pyrexial bouts, and any good results which ensue are usually attributed to the beneficial effects of the fever. On a previous occasion,[1] I drew attention to the fact that intramuscular injections of sulfosin * are almost invariably followed by a considerable degree of leucocytosis, which may persist for as long as 48 hours, and which tends to increase rather than to diminish as the treatment progresses. Since that time, it has been possible to carry out a number of animal experiments, the results of which may be of some interest to those who employ this drug in clinical practice.

EXPERIMENTS ON ANIMALS.

If a rabbit is given a series of daily injections of sulfosin, an increase in the number of white cells in circulation becomes evident within a few days, and this leucocytosis is more or less maintained as long as the treatment is continued. Fig. 1 illustrates very well what occurs. On it are recorded the results of a number of leucocyte counts, performed daily on a rabbit, over a period of nine weeks.

For the first four weeks, during which no sulphur was administered, control observations were made, and the broken line indicates that throughout this period the number of leucocytes never exceeded 9000 per c.mm. The temperature (unbroken line) varied between 101·2° and 103·4° F., which is within the limits of normality for a rabbit. At the commencement of the fifth week the animal was given an injection of 1 c.cm. of sulfosin, and this dose was repeated on 23 consecutive days. After the fourth of these injections the leucocytic curve commenced to rise, and remained above the normal upper limit during the whole period of inoculation. Well-marked oscillations occurred from time to time, and the highest count recorded was 25,500 per c.mm. When 23 doses had been administered the sulfosin was discontinued, and thereafter the number of leucocytes began to diminish, normal limits being regained within a few days.

The leucocytosis was due to an increase of polymorphonuclear cells, which corresponds with what occurs under similar circumstances in man. The animal appeared to suffer no discomfort throughout the experimental period, except on one occasion, after the twenty-third injection, when it seemed out of sorts, and exhibited a subnormal temperature. A day or two after the withdrawal of the drug this indisposition had completely passed away, and the rabbit seemed as lively and healthy as ever. It will be noticed that no marked elevations of

[1] Power, T. D.: THE LANCET, 1930, ii., 1289.
* This is the trade name given to a preparation consisting of a 1 per cent. suspension of sulphur in oil.

temperature appear upon the chart, but this is probably because readings were taken only once in the 24 hours.

The above experiment was repeated on eight rabbits with substantially the same results. The bone-marrows of these animals were submitted to microscopical examination, and in every case a marked degree of hyperplasia was found to have occurred. This varied in proportion to the amount of sulfosin administered, and in some cases was evident macroscopically as well as microscopically. The leucoblastic tissue was most affected, but the erythroblastic elements and megakaryocytes did not entirely escape. Fig. 2 illustrates the general appearance of such a bone-marrow, and may be compared with Fig. 3, which represents the same organ of an untreated rabbit under identical magnification. Both specimens were taken from the femur. It will be noticed that in the case of the treated

FIG. 1.

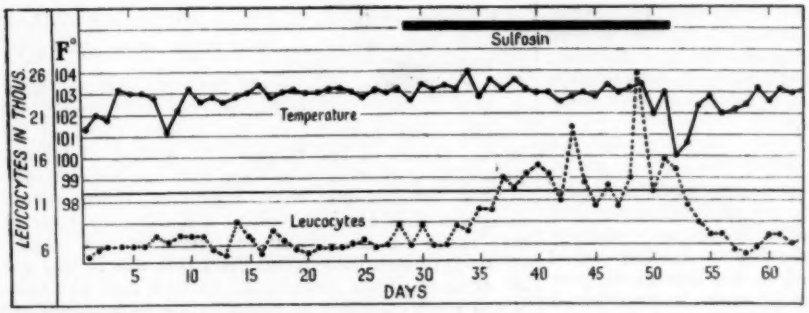
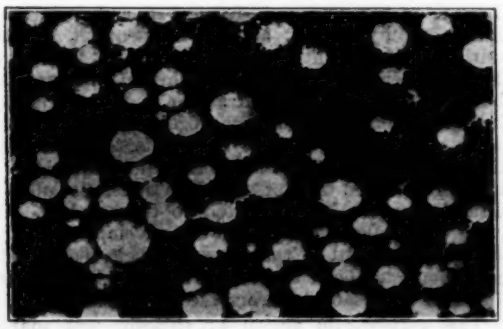


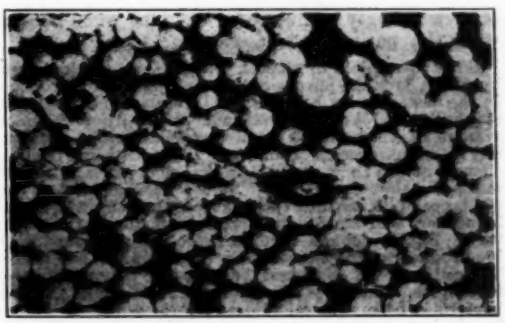
Chart showing effect of sulfosin on temperature and leucocyte count (in thousands).

FIG. 2.



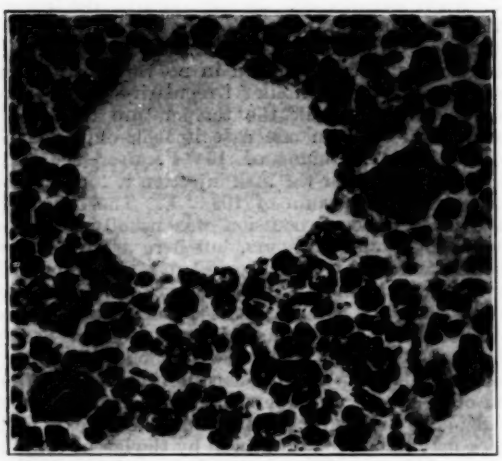
Illustrates hyperplastic condition of bone-marrow after administration of 29 injections of sulfosin. Note the decrease in number of fat spaces, and marked excess of cellular tissue. (× 75.)

FIG. 3.



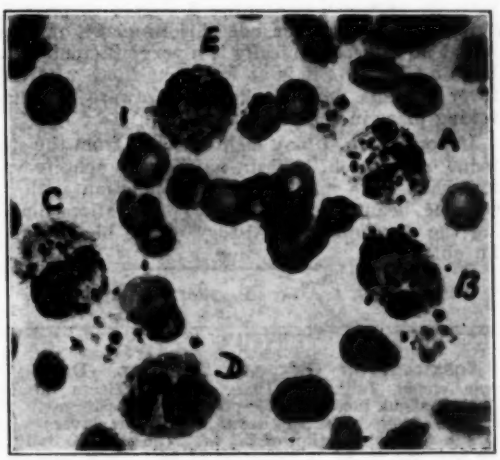
Illustrates appearance of normal rabbit's bone-marrow taken at same magnification as Fig. 2. (× 75.)

FIG. 4.



A higher magnification of hyperplastic bone-marrow shown in Fig. 2. Illustrates in detail nature of newly formed cellular elements. The cells with deeply staining nuclei are erythroblasts, while those with granular cytoplasm are either myelocytes or polymorphonuclear leucocytes. There are two giant cells in the photograph. (× 560.)

FIG. 5.



Phagocytosis following sulfosin administration. Blood taken from patient exhibiting leucocytosis and incubated with bacteria. Cells marked A, B, and C are mature polymorphonuclear leucocytes, and have ingested a considerable number of cocci; cells E and D have not yet begun to show nuclear lobulation, and only manifest slight phagocytic activity. (× 1000.)

animal there is a definite diminution in the number of the fat spaces, and a corresponding increase in the cellular elements, which, of course, consist of developing blood corpuscles. A better idea of the nature of the newly formed tissue may be obtained from Fig. 4, which depicts the same specimen as that shown in Fig. 2 under higher magnification. The majority of the cells appearing in this photograph consist of myelocytes or polymorphonuclear leucocytes, but there is a fair sprinkling of darkly stained erythroblasts, and two megakaryocytes are also seen. The nucleus of one of the latter appears to be pyknotic, but this is not an uncommon finding in the bone-marrows of normal rabbits.

PHAGOCYTIC ACTIVITY.

I have given only the barest outline of these animal experiments, but anyone who is sufficiently interested can repeat them for himself. I cannot conclude, however, without briefly referring to another aspect of sulphur therapy as applied to the human subject. A certain number of patients in whom a leucocytosis has been evoked in this way exhibit a "shift to the left" of the Schilling index, and this "shift" tends to become more marked with a repetition of the injections. It occurred to me that it might be of some interest to investigate the behaviour towards bacteria of such strongly stimulated leucocytes when incubated with the patient's own serum.

With this object in view, I utilised the technique devised by Knott [1] for the purpose of controlling the doses of X rays in the treatment of leukæmia. An emulsion of well-washed staphylococcal bacteria was incubated with four times its volume of a sample of blood obtained from a patient the day after an injection of sulfosin. The individual in question showed at the time a considerable leucocytosis, with a well-marked "shift to the left" of the Schilling index. After the lapse of 20 minutes the mixture was removed from the incubator, and stained preparations made in the ordinary way. Fig. 5 depicts a photomicrograph of one of these blood smears, and shows very clearly what has occurred. The cells marked A, B, and C are mature polymorphonuclear leucocytes, and have ingested a considerable number of bacteria, whereas the cells E and D, where nuclear lobulation is only just about to commence, manifest phagocytic activity to a very poor degree. The experiment was repeated on several occasions with the same result.

The experiments described show that sulfosin is a powerful leucoblastic stimulant, and the leucocytes which appear in the circulation are capable—at any rate in vitro—of exhibiting a degree of phagocytic activity. Whether or not this property of sulphur might be utilised clinically is a very different matter, but at all events it is as well that those who induce fever by this method should be aware of what is taking place in the patient's body.

In conclusion, I may mention that, from the standpoint of research, sulfosin has a very definite value, for when it is employed in conjunction with vital staining, beautiful microscopical preparations illustrating the developmental history of the blood-cells can be obtained.

[1] Knott, F. A.: Guy's Hospital Rep., April, 1930.

NORTHAMPTON GENERAL HOSPITAL.—During the year ended July 1st, 1931, the in-patients numbered 4207, a slight increase; 254 were private patients. Their average stay was 19 days, and their average cost £7 19*s.* 3*d.*, a reduction of 2*s.* 4*d.* The average daily cost per bed was 8*s.* 8*d.*, a reduction of 5*d.* There were 18,230 out-patients, a small increase; the average cost of each was 7*s.* Nearly one-fourth of the in-patients spent an average of 13 additional days in the Margaret Spencer Home of Rest, which is now used as a hospital for recovery for cases needing further treatment. An out-patient clinic for the treatment of early mental cases has been established.

TREATMENT OF DEMENTIA PRÆCOX WITH SULFOSIN.

BY WILLIAM MCCARTAN, M.D., D.P.H. BELF., D.P.M.,
SENIOR ASSISTANT MEDICAL OFFICER, WEST PARK MENTAL HOSPITAL, EPSOM.

A SERIES of 23 cases of dementia præcox has been treated with sulfosin, introduced and advocated by Schroeder.

The injections were made into the tissues immediately around the periosteum of the femur, the needle being passed into the middle third of the lateral aspect of the thigh. The danger of femoral periostitis appeared to be very real and consequently aseptic precautions were rigid. A more remote danger is that of oil embolism and a routine practice was made of attempting to withdraw the plunger of the syringe a little when the latter was in situ and of refraining from introducing sulfosin into the thigh if the least quantity of blood in the syringe showed that a vessel of any size had been inadvertently punctured. Blood was withdrawn on three different occasions during the series.

The usual procedure was to start with doses of 1 c.cm. and repeat the dose at four-day intervals increasing by 1 c.cm. at each subsequent injection until a total of eight to ten injections had been given. Rapid general debilitation was noticed in most cases, but this was transient and at the end of a course of injections patients rapidly regained their normal state of nutrition. Apart from this temporary loss of weight and a certain stiffness and discomfort in the legs at the site of the injections, no physical disability could be attributed to the sulphur. One case certainly did appear to develop a pyelitis subsequently, but in this case it is believed that the condition had been somewhat remotely pre-existent and had been latent during the treatment.

The pyrogenetic action of sulfosin was marked in all patients except one—a case of extreme catatonic stupor which will be referred to separately later. The temperature commenced to rise usually in from seven to ten hours from the time of the injection, but periods of as short as three hours and as long as 20 hours were noted. In each patient the length of this "incubation period" varied greatly with the different injections. This variation was entirely irregular and corresponded in no way with the size of the injection. Similar irregularity was observed in the time it took the temperature to reach its maximum—e.g., in one case it took only one hour to reach a maximum of 104° F. after the fourth injection but after the fifth injection it took 20 hours to reach a maximum of 103·8° F. The duration of the fever on each occasion was usually somewhere between 30 and 40 hours, but here again there was a wide irregularity, the shortest pyrexial period being ten hours (maximum temperature on this occasion being 102·8° F.), the longest pyrexial period being 62 hours (the maximum temperature on this occasion being 102·4° F.). The case which subsequently showed a flare-up of a pre-existing pyelitis did present on one occasion a temperature which lasted 72 hours, but one is inclined to assume that the pyrexia in this case may have been influenced by the latent condition of the kidneys. The mean of the height of all the peaks of all cases (excluding the one case of catatonic stupor already referred to) was 103·2° F. The smallest peak recorded in any case was 100·2° F., the highest 104·6° F.

In the case of extreme catatonic stupor the difference in the temperature response to sulfosin was so marked that it is considered separately from the other 22 cases. The maximum temperature obtained was 101·8° F. and the smallest peak was 99·0° F. The mean of all the peaks was 100·4° F. The technique of the injections was in all respects similar to that employed in the other cases, and the patient has not improved in the 14 months which have ensued since the injections.

Only definite cases of dementia præcox were included and, of course, no case displaying any physical abnormality was subjected to the treatment. There was no discrimination on the question of the probable duration, the longest being of at least 11 years' standing and the most recent being of at least two to three years' duration. Cases in which a definite degree of mental deterioration was obvious were not included in the series. In no case can it be claimed that complete normality ensued, but seven cases showed varying degrees of improvement, and the remaining 16 cases showed no improvement at all. Of the cases which showed improvement, four showed a marked improvement, and three a moderate improvement. Even in the cases that improved most markedly the shadowy background of the psychosis, best described as a definite "schizophrenic personality," persisted. Six months has elapsed since the last of the series was treated, and one case has relapsed—i.e., one of the four showing marked improvement.

The above results are not very encouraging, and this all the more so when one takes into account how difficult it is to assess how far any improvement can be attributed to sulfosin, since the possibility of the occurrence of spontaneous improvement has to be considered. Assuming that the sulfosin is responsible for certain of the improvements recorded, it has yet to be determined whether these beneficial results are due to the pharmacological effects of the sulfosin or to a possible factor suggested by McCowan—i.e., the intensive individual nursing attention that patients undergoing the treatment receive. However, a therapeutic measure which may hold out any hope of even a slight improvement in the prognosis of this disease appears to be justified until supplanted by something more specific.

I am indebted to Dr. F. L. Golla, Dr. P. K. McCowan, and Dr. N. Roberts for their interest, and to the latter for permission to publish the cases.

CLINICAL AND LABORATORY NOTES

VARIOLA MINOR COMPLICATED BY APPENDICITIS DUE TO THREADWORMS.

By A. T. W. Powell, *M.C.*, M.B., B.S. Lond., D.P.H.,
MEDICAL OFFICER OF HEALTH FOR THE BOROUGH OF WALTHAMSTOW.

A boy, aged 13, unvaccinated, was notified by Dr. William Menzies on Jan. 19th, 1931, as suffering from variola minor. He was removed to Walthamstow Small-pox Hospital on the same day for isolation and treatment.

The onset of illness with backache and headache was on Jan. 14th, and the rash appeared on the 18th. On admission to hospital on the 19th, there was a copious eruption, but the boy had little or no constitutional disturbance and no fever. On the 29th, however, a fresh eruption occurred which was entirely superficial and of an urticarial character. On this day the hospital was visited by Dr. W. V. Shaw who saw this patient. He remarked that a secondary eruption sometimes occurred during the period of desquamation in small-pox. In view, however, of later findings in this case the urticaria may have been due to another cause. The secondary eruption increased in extent until Jan. 31st, when it began to subside.

A few days later, on Feb. 3rd, this boy suffered some pain in the abdomen and by the next day had slight pyrexia and a pulse-rate of 92 per minute. On examination it was found that there were few physical signs, but some tenderness on deep pressure in the right iliac fossa was discovered; also rectal examination caused pain in the right side of the abdomen. A provisional diagnosis of appendicitis was made and the patient was kept under close observation. Four-hourly temperatures were taken and by 10 P.M., it was found that the temperature was 102° F. and the pulse-rate 110 per minute. By this time a diagnosis of appendicitis seemed quite clear.

The boy had recovered from his attack of variola minor, desquamation was complete, and in fact, he might have been discharged, but probably no general hospital would have accepted him as a patient.

Mr. M. J. Smyth, saw the patient in the early hours of Feb. 5th, and confirmed the diagnosis of appendicitis. He had brought the necessary instruments and dressings and a two-bed hut was hastily improvised as an operating theatre.

The operation was straightforward and no complications were met with. A long appendix with no external inflammation and apparently normal was removed. Subsequently, when the appendix was opened a small area of inflammation was found about the middle of its length, and half a centimetre in diameter. In the centre of this inflamed area was a single threadworm.

The patient made an uneventful recovery and was discharged on Feb. 23rd.

A CASE OF ANTHRAX.

By G. de Bec Turtle, M.D. Durh., M.R.C.P. Lond.

A woman, aged 71, consulted me complaining of a painful swelling at the back of her neck, which she thought was the result of a sting three days previously. She looked ill and very toxæmic, the temperature was 99° F., and the pulse-rate 100. On examination there was a minute black spot with one vesicle at the side, situated over the seventh cervical spine, a large surrounding area being indurated, and malignant pustule was suspected.

In the evening of the same day the temperature had risen to 102° F., and the pulse to 112. The induration had increased, and the black spot was larger, several vesicles having appeared around it. A microscopical search of the serum from a vesicle did not reveal any anthrax bacilli, and it was concluded that the infection must be streptococcal in origin; 20 c.cm. of anti-scarlet fever serum was injected subcutaneously. On the following morning the temperature was 100° F., and the pulse-rate 100, and the patient's general condition appeared a little better, but the local condition had not altered at all. By the afternoon of the same day, however, the temperature was 102° F., and the pulse-rate 104, and the induration had markedly increased, extending round the neck and down over the clavicles into the breast tissue. Excision of the pustule was decided upon, and the same evening was performed under gas-and-oxygen anæsthesia, a large area being excised. A crucial incision was made, and four flaps dissected

back, exposing an area about 2 inches in diameter. The most severely indurated tissue was excised and the wound was packed. As will be seen from the pathologist's notes, anthrax bacilli were grown in scanty numbers from a portion of the excised material.

Sclavo's serum (40 c.cm.) was administered immediately after the report from the pathologist was received, and 10 c.cm. more the next day. The temperature fell, the pulse improved, and the indurated area began to decrease in size. The wound was dressed at first with solution of perchloride of mercury 1 in 2000, later with acriflavine, and finally with eusol. The patient has made a slow but uneventful recovery.

Pathologist's report.—Swabs taken showed in direct smears one or two isolated cocci and an occasional pair of degenerate cocci. There were no cells present in the exudate. Cultures gave a very scanty growth of *Staphylococcus albus*. Cultures from the excised material on the following day showed two colonies of staphylococci and two colonies of *B. anthracis* on six heavily inoculated tubes. The organisms were therefore extremely scanty, and none was detected in direct smears. The identity of the colonies of *B. anthracis* has been established by inoculation into mice; the mice died between 24 and 32 hours after inoculation with a pure culture of the bacilli, and post-mortem bacillus anthrax in very large numbers and pure culture was recovered from heart's spleen pulp and peritoneal exudate. The swabs from the wound taken four days later showed pus cells and large numbers of staphylococci, and the cultures have given a pure growth of *Staphylococcus aureus*.

The case is of interest as occurring in a patient who lived in a hotel, a community where anthrax is not likely to be met with or suspected. No history could be obtained of any recent purchase of furs or new brushes, in fact it was entirely negative.

I am greatly indebted to Mr. Arthur Edmunds and Dr. E. ff. Creed for their assistance.

London, W.

A CASE OF PSYCHOSIS WITH HYPERTHYROIDISM

TREATED BY ERGOTAMINE.

BY JOHN H. EWEN, M.R.C.S. ENG., D.P.M.,

ASSISTANT MEDICAL OFFICER, SURREY COUNTY MENTAL HOSPITAL, NETHERNE.

AMONG others, Rothlin[1] and Porges and Adlersberg[2] have studied the action of ergotamine in endocrine disorders, especially Graves's disease. Ergotamine is an inhibitor of the sympathetic, its action being analogous to that of atropine on the parasympathetic. It diminishes the tonus of the sympathetic, and according to Maier[3] this beneficial diminution persists after discontinuing the treatment. Its use in Graves's disease is not without danger, and Labbé and Besançon[4] have recorded cases in which its exhibition has been followed by hemiplegia and collapse; but, as Porges has pointed out, there is often a personal idiosyncrasy to ergotamine in cases of hyperthyroidism, and these ill-effects may be avoided by adopting a judicious dosage and regulating the dose to the individual case.

The undoubted benefit conferred by ergotamine in certain cases of hyperthyroidism seems to justify its employment in the mental disorders associated with exophthalmic goitre, and in the case described below its use was followed by most encouraging results.

A married woman, aged 30, was admitted under certificate to Netherne Mental Hospital on Jan. 21st, 1931. For some time previously she had been receiving treatment at a private mental hospital.

Mental state.—She was excited, restless, confused, and extremely impulsive. Her conversation was disconnected, rambling, and almost incoherent, and she displayed complete lack of insight. She had vague persecutory ideas, and was suspicious and apprehensive. At times she became very agitated, and laughed and cried without reason. She was particularly prone to emotional outbursts, during which time she showed several marked mannerisms. On the day after admission she made a determined attempt to escape, and on several occasions only the most careful supervision circumvented her efforts to get away. A month after admission she made a serious attempt at suicide, and following this she was regarded as actively suicidal and placed under special care. Briefly, she was entirely irresponsible, and her mental condition was such that a most guarded prognosis was indicated.

Physical condition.—She was sallow and thin. Pulse-rate 70, regular. There was some slight enlargement of the thyroid and exophthalmos was present but not marked. There was no tremor. A month after admission, however, the signs of exophthalmic goitre became more evident. There was tachycardia, with tremors of the hands, and the exophthalmos became obvious. The thyroid increased in size, and the circumference of the neck appeared to vary with her mental state, being greater when her mental symptoms were worse. At this period the basal metabolic rate was +32·9 (Read's formula).

Treatment.—Five months after admission treatment by ergotamine was commenced. Subcutaneous injections of 0·25 c.cm. ergotamine tartrate were given daily and, in the absence of secondary effects, the dose was increased to 0·5 c.cm. This was continued for three weeks, and followed by oral administration of 0·001 g. ergotamine t.d.s. for another three weeks. At the same time dietetic measures were adopted, and proteins reduced to a minimum. Milk and butter were also restricted, and carbohydrates increased. Under this régime she lost 4 lb.

Results of treatment.—Mentally there has been very evident improvement. The patient is now rational, converses normally, and displays marked insight. The agitation has completely disappeared, and the restlessness and impulsiveness which were such a feature of her previous mental state have been replaced by calmness and judgment. There is a realisation of responsibility, and in place of confusion a logical sequence of thought. Her mannerisms have disappeared. With regard to the thyroid condition, there is now very little enlargement of the gland. Tremor and tachycardia are absent, and exophthalmos is only very slight. The basal metabolic rate is +27·5 (Read's formula). She has been discharged, and the latest reports indicate that she is leading a normal useful life.

This case is remarkable for the severity of the mental symptoms, the difficulty of prognosis, and the rapidity of improvement under ergotamine.

I am indebted to Dr. P. C. Coombes, medical superintendent of Netherne Mental Hospital, for permission to publish these notes.

[1] Rothlin, E.: Med. World, Nov. 4th, 1927.
[2] Porges, O., and Adlersberg, D.: Bull. et mém. Soc. méd. hôp. de Paris, 1929, liii., 1202.
[3] Maier, H. W.: Rev. Neurol., 1926, xxxiii., 1104.
[4] Quoted by Porges (ref. 2).

PRINCE OF WALES'S HOSPITAL.—Sir Albert Barratt recently laid the foundation-stone of a new out-patients' department at this Tottenham hospital which, when completed, will cost £30,000, and will include tonsil and adenoid departments and wards for paying patients. Owing to lack of means, the first part only of the scheme is being undertaken at present.

FROM "COTTAGE" TO "GENERAL" HOSPITAL.—During the past fortnight the governing bodies of two cottage hospitals, Romford and Malmesbury, have decided to call them general hospitals. The reason given for the change at Victoria Cottage Hospital, Romford (33 beds), is that the limitation in the name makes it difficult to obtain nurses, and that probationers feel that they are wasting their time at "a dead end with no prospects." In 1931, the number of in-patients was 598, a reduction of 52, owing to the hospital having been partially closed for repair and decoration. The Malmesbury Cottage Hospital and Maternity Home (30 beds) is to omit the word "cottage" because, "in view of the status the hospital has acquired, the committee consider that the prefix is rather a misnomer." There were 370 in-patients last year, the largest number yet admitted.

MEDICAL SOCIETIES

MANCHESTER MEDICAL SOCIETY.

A MEETING of this society on Feb. 3rd, with Prof. J. S. B. STOPFORD, the President, in the chair, was devoted to

Poliomyelitis.

Dr. R. W. FAIRBROTHER said that there seemed to be no doubt that the causative agent was a small particulate body belonging to the group of filtrable viruses. As it could not be cultivated by the ordinary means it could only be studied by animal inoculation. The following properties had been established, despite experimental difficulties; it was extremely resistant to freezing, drying, pure glycerin, and 0·5 per cent. phenol, but was readily destroyed by heat over 45° C. and oxidising agents. It retained its activity when left in milk at room temperature for 30 days. It could not yet be obtained entirely free from nervous tissue, which might modify its activity.

The epidemiology of the disease presented a fascinating but complex problem, and the theory propounded to explain it was that the virus was usually present in a populous community and infected a large number of people, most of whom developed a "sub-clinical" infection and so acquired immunity and became healthy carriers. Those who had actually developed the disease were usually children between the ages of 1 and 12; infants probably escaped owing to limited exposure to infection and the presence of maternal antibodies in their blood. Most children over 12 had acquired immunity, and after a widespread outbreak the majority of people had marked immunity, so that the soil was not suitable for the persistence of the virus. The chance of sub-clinical infections occurring during the next few years was then diminished, and a susceptible community might be produced. The introduction of the virus into a virgin population had caused extensive outbreaks involving persons of all ages.

The mode of spread was probably droplet infection from the nasopharynx, but some authorities held that drinking water or milk might convey the disease. The seasonal incidence remained unexplained. There was a difference in individual response, producing spinal, bulbar, and abortive forms of the disease, as well as certain rare and ill-defined varieties. The variations depended on the dosage of the virus received and possibly on different strains, as well as on the degree of resistance of the individual. Recent researches suggested that the virus, invading the tissues of the nasopharynx, passed to the brain by the axons of the olfactory nerve and thence to the cord by the motor fibres of the pyramidal tract, attacking various nerve-cells on the way. There was no evidence to suggest that it travelled via the cerebro-spinal fluid or the blood stream.

The clinical picture was very varied; there was frequently a prodromal stage characterised by fever, headache, vomiting, and malaise, with typical changes in the cerebro-spinal fluid—a pleocytosis, first polymorphonuclear and then mononuclear, and slight increase in the globulin, with no alteration in the sugar and chloride content. The mortality varied, but was usually about 10 per cent., and death was often due to involvement of the respiratory and cardiac centres. The characteristic lesions found post mortem were degeneration and vacuolation of the nerve-cells with neuronophagia, perivascular and meningeal infiltration.

Active measures should be commenced in the prodromal stage, and it seemed advisable, when poliomyelitis was in the locality, to regard all vague pyrexial conditions as potential cases and to examine the cerebro-spinal fluid. General measures included immediate isolation, rest, fluid diet, attention to the bowels, and symptomatic treatment. With these measures alone many cases cleared up entirely.

SPECIFIC THERAPY.

Protective immunisation could not be produced actively; the danger of introducing active virus into human beings was too great at present. Much progress in passive immunisation had been made during the last two years. It was essential that any serum used should possess a definite marked antiviral activity, and this could only be tested by the neutralisation test on monkeys. Convalescent human serum had proved extremely valuable, but its disadvantage lay in the time and trouble required to collect large quantities, and the need for preliminary precautionary tests on volunteers. Normal human serum might prove useful when antiviral serum was not obtainable, but strict neutralisation tests were necessary, since not every human serum was satisfactory. Immune monkey serum had very limited value, for the yield of serum per monkey was very small. Immune horse serum had only been fully investigated recently; only a limited number of horses produced a satisfactory serum, but those that did produced a good deal of it. There appeared no scientific justification for the use of antistreptococcal serum.

The serum used should be filtered, subjected to full sterility tests, sealed in ampoules, and stored at a low temperature. There seemed to be no reason why all large hospitals for children should not keep a stock of it. In the event of an outbreak of poliomyelitis all contacts, especially children, should receive a prophylactic dose of about 20–25 c.cm. intramuscularly. If the outbreak did not subside a further dose should be given after four or five weeks. Desensitisation would then be necessary. Similar treatment might be employed for doubtful cases before diagnosis was made, and gargling with antiseptic lotions might also be useful.

Therapeutically, the earlier the serum was given the better. It was therefore a good plan to examine the cerebro-spinal fluid at the bedside so that the serum could at once be given intrathecally if the diagnosis was confirmed. As large a dose as possible should be given; an average was 20 c.cm. intrathecally, warmed to 37° C., and 30 c.cm. intramuscularly or intravenously. The dose should be repeated every 24 hours until improvement was observed. The patient must be kept under observation for some time after the attack had settled down, as delayed attacks sometimes occurred. The results of serum treatment were not so successful after paralysis had appeared, but it might limit the spread of the lesions and so reduce the amount of permanent damage; it should therefore always be given. There seemed no doubt whatever of the beneficial effects of therapeutic serum. Its administration was comparatively harmless, whereas failure to give it might cause lifelong crippling.

TREATMENT OF PARALYSIS.

Mr. E. S. BRENTNALL spoke of the treatment of the disease once paralysis had appeared. The last few years, he said, had seen little distinct advance in the measures available for combating the results of severe paralysis, but they had witnessed the thoughtful evaluation of existing methods. It was also not to be forgotten that a much more adequate accommodation in country hospitals had become available in the last few years for the treatment of paralysis throughout its acute and convalescent stages, with additional provision for its subsequent after-care near the patient's home. Complete rest, with muscular relaxation and support, in a full length plaster-of-Paris bed was the most effective and simple means for dealing with the acute stage, and gave adequate protection against almost all deformity. Among the various physical measures appliable when the tenderness had gone, unloaded re-education was of overwhelming importance. The support of the affected muscles was only to be discarded when tentative freedom produced no interruption or impairment of recovery. As to the time for allowing weight-bearing, Lovett had shown that that was a most critical question for the patient with lower limb paralysis, and still more when spinal or abdominal weakness existed. Operative treatment was required in many cases to supplement conservative measures. The stretching of contractures by traction or by a series of corrective plasters was mentioned as being not only a now more popular, but a more rational procedure than sudden correction by division of the tight structures, though at times the rapid method was inevitable. Still later, operative treatment became necessary in order to improve the voluntary control at certain points, or otherwise to give stability and balance. Little progress seemed to have been made of late years in the treatment of paralysis of the upper limb. In a restricted field, tendon transplantation had proved of very considerable value, particularly in the case of the hand, but it appeared to have failed, or almost so, at the elbow and shoulder. In the lower limb tendon transplantation in general was disappointing as an isolated means of controlling paralysis.

Mr. ROBERT OLLERENSHAW demonstrated, by photographs and radiograms, his technique in transplantation of the long extensor tendons of the toes in cases of pes cavus, a method which he considered much superior to the other methods in common use. He also showed radiograms of the operation of stabilisation of the foot combined with a posterior "bone-stop," as advocated by Campbell, and pointed out its great value in cases of "dangle foot" which had an active quadriceps extensor.

Mr. S. M. MILNER drew attention to what, in his opinion, should be one of the aims of treatment in infantile paralysis—namely, the elimination of splints. Much could be done by surgery to stabilise flail joints; spinal fusion as carried out by Hibbs has much to recommend it, as eliminating a heavy spinal support. In the foot astragalectomy was advised as carried out by Whitman in the cases for which it was suggested (calcaneo-valgus deformity).

Dr. D. SAGE SUTHERLAND referred to a case in which paralysis was present which had been successfully treated with horse serum.

Dr. F. R. FERGUSON asked whether convalescent human serum or any form of potent serum was available in England for use in the event of an outbreak of poliomyelitis. He also wondered in how many cases Dr. Fairbrother had been able to test the value of this immune horse serum.

The PRESIDENT asked on what evidence Dr. Fairbrother based his view that the spread of the virus took place by the motor pathway, and how the virus reached, as it undoubtedly did, the posterior root ganglia?

Dr. FAIRBROTHER in reply said that unfortunately there was no organisation in this country which maintained a supply of immune serum. Only a few cases had been treated in this country with immune horse serum, but in each instance marked improvement was observed. The number, however, was too small to be of any practical importance.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF MEDICINE AND SURGERY.

ON Feb. 3rd, with Dr. H. MORLEY FLETCHER, President of the Section of Medicine, in the chair, these sections joined in a discussion on the diagnosis and treatment of

Abscess of the Lung.

Dr. R. A. YOUNG said that improved diagnosis showed abscess of lung to be more common that was formerly supposed. It might arise in one of several ways, and it was important to determine the manner in which the suppurative process involved the lung tissue, for this would greatly influence the line of treatment. The condition might follow inhalation of foreign bodies or of infective material into bronchi, especially during nose and throat operations, and was then usually localised in the upper lobe. Secondly, it might originate in the lung parenchyma, from what was often called pneumonitis. A third form was embolic abscess, which was usually multiple and occurred in septicæmia, especially right-sided infective endocarditis, and as a result of such remote processes as otitis, appendicitis, and infective thrombophlebitis. There were, fourthly, abscesses from extension of suppurative processes from mediastinum, bronchi, abdominal organs, or vertebræ. Again, lung abscess might result from the breakdown of new growth or from necrotic changes in adjacent lung tissue caused by an obstructed vascular supply. These abscesses, constituting about 10 per cent. of the whole, were often in unusual situations and so were a common source of confusion in diagnosis. Finally, lung abscess might result from perforation of chest wall, involving fracture of ribs. Gangrene of lung occurred under conditions in which the infective agent was especially virulent, or the patient was debilitated.

Abscess was most often simulated by interlobar empyema. Bronchiectasis might cause difficulty, but lipiodol usually established its presence. New growth was difficult to exclude, and might coexist with abscess. Radiography with the use of lipiodol, sometimes combined with bronchoscopy, might give the necessary clue. The history, in its suggestion of the cause, was very important; suspicion of abscess should always be aroused if there were fulminating pulmonary symptoms after operations on the nose and throat, or after a foreign body had been inhaled, or if there was increasing fever and expectoration of pus in cases of delayed resolution following pneumonia. Pulmonary symptoms during the course of malignant endocarditis, or in septicæmic or pyæmic conditions, might indicate abscess formation. But

pulmonary suppuration was not always acute in onset, nor always markedly febrile. In chronic abscess, especially after rupture, the fever was often irregular; a copious discharge of pus was often succeeded by an apyrexial stage. This usually indicated an abscess opened into a bronchus but not draining effectively, with periodic retention and partial evacuation. An early symptom often noted by the patient was an unpleasant taste or a sensation of foul gas about the breath; this sometimes preceded actual rupture by several days. In gangrene the discharge was extremely foul, and masses of necrotic lung tissue might be found in it. Hæmoptysis occurred in about 70 per cent. of the cases and, especially in gangrene, might be so profuse as to be fatal. Pain was usual, and sometimes was severe; in chronic cases the dyspnœa might be slight. Sometimes lung abscess developed without either rigors or profuse sweats. Often the physical signs were slight and equivocal; before a superficial abscess ruptured there might be dullness with weak breath sounds and perhaps a few râles because of congested lung tissue around. In chronic abscess clubbing of fingers might develop in as short a time as eight weeks.

Radiological evidence was very valuable; it was sometimes conclusive, and it helped to localise the abscess. When surgery was likely to be invoked radiograms taken in different positions were indispensable. After rupture the appearance of a fluid level in the cavity was diagnostically helpful; hence a radiogram with the patient erect should always be taken. Lipiodol he found useful in excluding other conditions; usually lipiodol did not enter the abscess cavity, for the entering bronchus was, in most cases, obstructed. Almost invariably the blood of these patients showed leucocytosis up to 20,000 or 30,000, with a relative polymorphonuclear increase. When rupture took place the discharge was almost pure pus; elastic tissue was almost always present. Exploratory puncture being dangerous, should not be employed, for it might lead to a widespread infection of the pleura and of the needle-tract, or might precipitate rupture into a bronchus.

Treatment should be medical in acute cases, at least until the suppurative process was localised. With medical attention a proportion of patients—variously stated at from 10 to 30 per cent.—recovered completely after rupture. When rupture occurred, the patient should be turned to the affected side; otherwise, with large abscesses, there was risk of suffocation. Postural drainage was of great value, and if the patient's condition permitted, he should hang over the bed at least twice daily to encourage evacuation by coughing. When cases were almost afebrile a creosote vapour-bath could be given. Organic arsenical compounds could be given in gangrenous cases and those with fœtid sputum.

Dr. Young concluded by stating his views on the surgical aspect. He remarked that he considered artificial pneumothorax dangerous and undesirable; frequently, however, phrenic avulsion was of value. Lobectomy might be a method of choice.

SURGICAL TREATMENT.

Mr. J. B. HUNTER dealt only with single abscess, and only such as occurred without dilatation of bronchi. Lung abscess was more common, in his view, than was generally recognised. There was a form of small abscess, usually in the upper lobe, which was completely evacuated after violent coughing, and was cured spontaneously without its presence having been suspected. Men had this condition more than women, and it was commoner in the right than in the left lung. The character of the abscess depended much on the patient's resistance, the virulence of the organisms, and the position of the abscess. The closed type of abscess needed surgery much more than did the acute type which was draining into a bronchus. The onset was usually abrupt, and might be heralded by rigors, or by less severe fever and milder malaise. In the acute stage blood was present in the sputum, altered in character, and the sputum was frothy. Radiological appearances were very helpful; a shadow could be seen in the affected lobe, circular in shape, with a fuzzy outline. Usually there was a clear area between it and the mediastinum. In rare cases the fluid level could be seen. Diagnostic needling of the lung should not be carried out, as one could not know whether pleural adhesions were present. A considerable number of patients got well with expectant treatment, mostly those with abscess of the upper lobe, the difficult site to deal with surgically.

Mr. Hunter held that the choice of the anæsthetic was very important; the lung was already damaged, and a large abscess might burst into a bronchus during manipulation and drown the patient. Some non-irritating anæsthetic should be used; his own preference was for gas and oxygen preceded by avertin. When bronchial fistula occurred it was due to inadequate collapse of the chest wall at the time of operation. Two further possible complications, even in the absence of any operation, were secondary bronchiectasis and abscess of the brain. His view was that many lung abscesses were due to a combination of embolism and the use of a volatile anæsthetic.

Dr. JAMES MAXWELL said that gangrene of the lung was the result, mainly, of a necrotic process, due to interference of the blood-supply. Lung abscess was a not uncommon sequel of lobar or bronchopneumonia, and the aspiration of septic material was probably the second most frequent cause. If adequate drainage could be established, the tendency was always towards healing; hence, at first, the treatment should be expectant. Often bronchoscopic drainage was useful. As a rule, artificial pneumothorax should not be attempted, and surgery should be reserved for cases which had become chronic; certainly it should be employed if no improvement was manifest at the end of ten weeks.

RADIOGRAPHY AND BRONCHOSCOPY.

Dr. PETER KERLEY considered abscess of the lung to be a comparatively rare disease, and it was of paramount importance to determine the mode of infection; the picture was only slightly altered according to the nature of the infection. In about 5 per cent. of cases more than one abscess was present in the lung. The radiographic findings constituted a good guide to the best treatment and to the prognosis, and X ray pictures should be taken at intervals. A lipiodol injection should always be made. The differential diagnosis could be very difficult; in some cases it could only be made by a correlation of the clinical and the radiological findings. Though a rare factor, syphilis should always be borne in mind.

Mr. V. E. NEGUS spoke as a laryngologist in favour of the bronchoscopic diagnosis and treatment of lung abscess. It was his view that every case of even suspected lung abscess should have such an examination carried out; before this was done it was impossible to say which cases would be improved or cured, and no harm could follow the skilful use of the bronchoscope. Only local anæsthesia was needed. Parenchymatous abscesses did not communicate with

a bronchus. A suction tube could be passed through the bronchoscope into different bronchi, to see if it would strike pus. If the search was negative, the case was unsuitable for bronchoscopy. In another type the abscess communicated with a bronchus, the latter being plugged, so that drainage was impossible. The bronchoscope was useful here, but its use should not be continued unless definite improvement was evident. In another type the patient was coughing up pus, but not freely. He referred to a patient who had had a chronic lung abscess for 12 years. He had had eight cases of lung abscess due to the inspiration of a foreign body, and in all of them removal of the foreign body brought about cure.

Dr. L. S. T. BURRELL referred briefly to lung abscess following operations on nose, throat, and teeth. There were four methods available: (1) to leave the patient alone, (2) to treat with a bronchoscope, (3) to drain surgically, (4) to induce pneumothorax. Looking through his cases he was impressed with the seriousness of lung abscess, and how impossible it was to advocate one method of dealing with all the cases. Bronchoscopy should not be done in cases where there was a foreign body. He was appalled by the number of people with lung abscess who appeared to do well but eventually died. Surgery, he thought, had not yielded the results which were expected of it. And the induction of pneumothorax he regarded as extremely dangerous in the case of superficial abscess. The safest treatment for an abscess which was central he believed to be collapse at an early stage.

Mr. A. TUDOR EDWARDS emphasised the fact that there were two types of symptoms in abscess of lung. There was a type in which the discharge from the abscess was continuous, and that was often confused with bronchiectasis. There were two types of effusion secondary to pulmonary abscess: one was the chronic, slow-forming localised empyema; these did very well. A different condition was that in which fluid collected in a large pleural cavity with almost no adhesions. Cerebral abscess did occur in relation to undrained lung abscess. He was becoming more convinced that drainage in these cases should be done in two stages; in the first, an adequate amount of lung tissue should be taken away, and in the second he used diathermy of lung with a button electrode. This latter prevented the projection of emboli into the circulation, for the vessels were sealed by the diathermy.

SECTION OF LARYNGOLOGY.

A MEETING of this section on Feb. 5th, with Mr. W. G. HOWARTH, the President, in the chair, was devoted to a discussion on

Common Colds and their Sequelæ.

Sir THOMAS HORDER defined a cold negatively as not paroxysmal rhinorrhœa or sneezing, hay-fever, acute naso-pharyngitis preceding an acute disease, nor even acute coryza, though to the layman these things were all "colds." A bout of sneezing might do the sufferer good by clearing the nasal passages. The common cold might be defined as an acute specific catarrh involving the upper respiratory tract, running a benign course for two or three days, with pyrexia and other constitutional symptoms, and protecting the patient for a short time only. Probably there was a specific infection due to a filtrable virus, associated with secondary infections by catarrhal organisms. The term "feverish cold" was justified by the inadequacy of clinical and bacteriological knowledge. The fewer organisms that could be demonstrated, the more safely the common cold could be diagnosed. Rhinitis, sinusitis, Eustachian catarrh, and pharyngitis all occurred in the type case, but individuals varied in the anatomical distribution of the infection. The disease might be trivial or devastating, and the toxæmia might be deep. There were also abortive cases. There was no evidence that the infection known as the common cold ever expressed itself as a chronic catarrh. Among the alleged predisposing causes were heredity, rheumatism, and gout, but these were very doubtful. The seasonal and age incidence were recognised. Exciting causes did not include mere cold or mere heat, but rapid changes in temperature might aid the specific materies morbi, which was probably a filtrable virus. The nearest solution to the difficult diagnostic problem presented was a careful clinical investigation.

Prophylaxis included general methods of preventing lowered resistance and cleaning the atmosphere; local disinfection, isolation, and inoculation. The belief that a "fit" and hard person was less liable to colds had much against it; many people developed colds on return from a holiday. Fitness did not protect against the primary infection, though it did help the patient with the secondary infections. Everyone would agree that physiological breathing should be taught, and unhealthy conditions of the nose and pharynx corrected, but there was no agreement on the best local prophylactic measure, and no evidence to support any one method. Isolation was important, but unfortunately the equally infectious mild case went free. Inoculation could only be empirical until the causal agent had been isolated. Curative treatment should begin at the earliest possible moment, and in many cases the cold could be aborted by a hot bath, copious hot drinks, a smart purge, a warm bed, and opium. After these, the subsequent treatment did not greatly matter, but the patient's faith in any given remedy should not be scouted. As the disease progressed, the treatment of the patient became more important and the treatment of the nose less important. Time alone could show the value of the numerous specific remedies now on the market. It was the duty of the profession—and of those who pressed these remedies on it—to maintain a healthy scepticism, and to promote research.

A LARYNGOLOGIST'S VIEW.

Sir STCLAIR THOMSON said that his researches, in collaboration with Prof. R. T. Hewlett, 37 years ago, had stood the test of time. They had demonstrated that the ciliated epithelium of the nose filtered off as many as 14,000 organisms in one hour's quiet breathing. The common cold was an infectious disease, and might be apostrophised in the words of Matthew Arnold:—

> "Others abide our question. Thou art free.
> We ask and ask. Thou smilest and art still,
> Out-topping knowledge."

As had been wittily said, the common cold lasted a fortnight, but if treated it only lasted 14 days. It might be defined as an acute or subacute catarrhal affection, commencing in the nose or post-nasal space, generally invading the sinuses and sometimes spreading to the Eustachian tubes, pharynx, larynx or further. Its greatest frequency was in the latter part of January, declining thence to the latter half of June, increasing sharply at the end of July, to reach a peak at the end of September, and another

at the end of November. No disease entailed a larger pecuniary loss by absence from work and decreased efficiency. Colds were least common at the two extremes of age. An investigation of students at Cornell University had suggested that the general physique and physical defects in cold-susceptibles were much the same as in others, and that cold-susceptible students gave a history of more infectious disease, asthma, and hay-fever than did normals. The report gave no support to many treasured ætiological fetishes.

The possible ætiological factors were atmospheric causes, cold, disturbance of metabolism, and infection. The French believed strongly in cold as a cause of colds, but Arctic explorers and other people exposed to cold disproved this theory. V. S. Cheney regarded a cold as a mild acidosis, and denied that it was infectious at all. The speaker was glad that treatment was not standardised, for every man got his cold in his own way, according to his general and local predisposition. Every case began as an acute sinusitis, and should be treated at once by rest in bed for 36 hours to three days, with warmth to the head, and wide open windows, the avoidance of all lotions and sprays, but the use of simple inhalations. Drugs should only be used to relieve symptoms—the relief given by salicin and similar preparations was well known. When the discharge became purulent, simple saline lavage was indicated.

Colds were unknown in sanatoriums, but inmates of these institutions were more liable than other people to peculiarly severe colds as soon as they returned to normal life. Light treatment and vitamins had been tried in America and proved to have no effect.

The cold was one of the penalties paid for civilisation, and might be a device of nature to vaccinate us against more serious evils.

BACTERIOLOGY OF THE COLD.

Dr. JOHN FREEMAN said that bacterial infection could be proved in all colds, the causal agents being pneumococci, streptococci, Pfeiffer's bacilli, diphtheroid bacilli, Friedländer's bacilli, micrococci, and staphylococci. These occurred in little epidemics throughout the catarrhal season. In the later stages of a cold the mouth showed an overwhelming growth of one or perhaps two organisms; in the early stages the watery discharge might be free from bacteria. The infections were so multiple that many attempts had been made to find an earlier primary infection; Dochez had gone near—if he had not reached—proof of a filtrable virus. The differential diagnosis of catarrhal conditions was still in a very early stage of development. Until the mechanism of a disease was known, its clinical classification must be provisional. The common cold was undoubtedly an infection.

In Dochez's experiments the virus seemed to differ from that of influenza, and to protect the chimpanzee for about three months. It incited the growth of bacteria living in the mouth at the time. We did not yet know whether the virus caused all colds, whether it was single or multiple; whether it was alive or a ferment. By itself it seemed to be trivial as a pathogenic agent; it was the secondary bacteria that did the damage and caused the danger. Therefore therapeutic policy at present was directed against the bacteria. Any antiseptic strong enough to harm the bacteria would damage the nasal passages; mild douches deprived the patient of the natural defences of his nasal discharge. Room-spraying was a psychological treatment. Dochez's experiments had shown that his volunteers were very apt to develop colds when they thought they ought to.

Vaccines seemed eminently the treatment of choice. A big enough dose must be given for prophylaxis, and this dose in the middle of the catarrhal season was likely to produce a cold. The dose must therefore either be given before the season or must be built up slowly. Septic foci meant carrying infection, and should be dealt with by vaccine therapy for the sake of the patient and of his neighbours.

DISCUSSION.

Dr. DAN MACKENZIE said that the common cold lay at the back of most of the inflammatory conditions that the oto-rhino-laryngologist had to fight. The whole subject was vague. The key to the position from the epidemiological point of view was probably the carrier; the carrier might, however, have no obvious disease between attacks. His experience of vaccines had been disappointing, and he was convinced that "hardening" treatment was fundamentally wrong for the carrier. He doubted whether the open window was the right thing for him either. The cause of adenoids was unknown, but children naturally curled up under the bedclothes; Sim Wallace had asked whether cold might not be the cause of adenoids in the English child. For curative purposes, ℥ 5 of collosol iodine in a glass of water had proved empirically very successful in colds.

Dr. P. WATSON-WILLIAMS distinguished between common colds and the chronic or established catarrhs, the sequelæ of acute catarrhs that did not end in recovery. In many families a parent was the perpetual source of infection, the infectivity being obscured by acquired immunity. Various anatomical defects played a part in establishing chronic catarrh. The symbiosis of infecting organisms also played a part in increasing virulence beyond normal resistance. While the ordinary common cold might be treated by the physician, the subjects of chronic catarrh and asthma should be investigated by the laryngologist. The best abortive remedy in colds was a massive dose of the hydrobromate of quinine—grs. 12–20; such remedies 24 hours too late, however, did more harm than good.

Mr. HERBERT TILLEY pointed out that the sinuses were always involved in the common cold; later the infective process tended to become localised, and discharge might be pent up. Neuralgia in the course of an acute cold was nearly always due to sinus infection; the diagnosis was confirmed by finding the middle meatus blocked by œdematous mucous membrane. A little cocaine and adrenalin placed in the region for three or four minutes and applied again three or four hours later would stop the process of obstruction. If the treatment could not be repeated, the area should be scarified when first seen. Middle-ear infection was one of the dangerous sequelæ of the cold. A dose of calomel, followed by a saline, and measures for local relief of pain (glycerin and boric acid or opium), with incision of the drum, was usually successful. The speaker advocated puncturing the drum as soon as it was inflamed, and not waiting for bulging, when it might be too late.

Dr. BEDFORD RUSSELL recommended cocaine to reduce the swelling of the mucosa as a preventive measure against sinusitis.

Sir THOMAS HORDER briefly replied.

SECTION OF PSYCHIATRY.

AT a meeting of this section on Feb. 9th, the chair was taken by Dr. BERNARD HART, the President, and a paper on the

Principles of Psychiatric Classification

was read by Dr. EDWARD GLOVER.

The psycho-analytic worker, he said, could not postpone for ever the task of correlating his formulations with psychiatric classifications. Psycho-analysis looked forward to an increasingly close alliance with pure psychiatry. Almost all thoughtful text-books drew attention to the difficulties and confusion of existing classifications—which gave an impression of matted complexity, a complexity which was in inverse ratio to the fundamental understanding achieved. An adequate system should be elastic enough to allow modification and indicate the possibilities of future research. It should present existing data in as comprehensible a light as possible, but should not force explanations on little-understood problems. A purely descriptive method was dangerous and retrogressive; it was unlikely to be either accurate or complete in view of the existence of unconscious elements. In the absence of general agreement on ætiology, however, a descriptive factor seemed inevitable, at any rate temporarily. To it could be added other factors which would amplify it and—most important—relate the phenomena of psychiatry to normal development. A sound classification must be built up in close relation to the development of the ego structure, and in particular to that phase during which the regulation of instinctual tendencies swung between the great primitive mechanisms of introjection and projection. This second factor must be supplemented by a third—a specific factor that would distinguish what the man in the street meant by madness—the psychoses—from other psycho-pathological phenomena. The closest approximation to a specific factor was loss of sense of reality—a disturbance of ego-object relation.

The speaker took three groups under his descriptive factor: a schizophrenic group characterised by withdrawal from reality, a depressive group, and a delusional group. The function of the ego was to effect a compromise between the demands of instinct and the possibilities of reality. The signal system by which the ego tested the success or failure of its manœuvres was anxiety. Anxiety was the alpha and guilt the omega of human development. The three possible manœuvres were sublimation or repression of the demands; lessened demands with some tolerance of frustration; and distortion of the ego. To the third group belonged the psychoses and neuroses. The ego, however well organised, was essentially a composite, even in a young child; from at any rate one year onward the ego was polynuclear. The earliest ego tendencies were derived from scattered instinctual elements, and gradually converged. The elements of the first primitive nucleus included all the erotogenic zones, together with all the aggresive centres, as well as the oral libidinal system. The fixation point of melancholia was oral; it would ere long be possible to determine the fixation points of schizophrenia. The last organised fixation points represented the neuroses. There was a great field for research here.

LOSS OF REALITY—PROVING.

There was much scope for confusion about the boundary between the ego and the object, since in auto-erotic phenomena the object was part of the subject's own body. An instinct that could be satisfied in the subject's own body was to some extent manageable; one that required a separate object was more difficult to master and was more likely to cause the psychic pain of frustration. Some colics could be relieved by expelling wind or ejecting a crumb—i.e., a "me" pain could be converted into a "not me." Here was the basis of the projection phenomena of paranoid states. The ego would be much safer from anxiety if it could convert pleasurable "not-me's" into "me's"; if the desired object could be introjected into the ego. This was the basis of the introjection mechanisms seen in schizophrenics. Inside the ego were the "pins" and "crumbs" of frustrated instinct, complicating the processes. When the pleasurable object was found to be not really a part of the ego, but only occasionally available, it became hateful; but to destroy it would be to "kill the goose that laid the golden eggs." Hence, there was serious tension. The child struck the bars of its cot and at the same moment the bars "struck back" hurting the child—here was the germ of persecutory ideas. Introjection was a mechanism for dealing with disappearing objects; whether the child loved or hated an object, the object was best dealt with if it could be got inside. Unfortunately, the result was often to get the ego's own head "in chancery" instead of the object. Hate raged against hate—the seeds of melancholia.

The mechanism of repression broke the vicious circle by sacrificing the primitive instinct; this process was the development of the super-ego. The child longed for a real reality, free from the terrifying results of projection. The function of parents was to provide a reassuring reality in this phase. The normal infant was in an acute psychosis and would continue in a state of anxiety unless it could come to terms with reality. If, in later life, repression broke down he would be plunged back into infantile anxiety. The potential psychotic was one who had a precarious adaptation to reality. Adult reality sense represented the capacity to maintain contact with objects, the objects through which infantile instincts were gratified and all possible substitutes. Society was not too exacting in its demands so long as a man did not try to kill his introjected enemies by suicide or his projected ones by homicide.

The main psychoses and neuroses could be classified by ego relations with objects quite simply in children, but in adults the classification would have to include certain character-states and formations not usually grouped with psychoses and neuroses. Introjective oral phases were linked with dementia præcox and melancholia; anal phases with obsessional states, and genital phases with hysteria and psycho-sexual inhibition. The projective oral phases were linked with the schizoid and paranoid group, the anal phase with drug addictions and compulsive character groups, and the genital phase with the anxiety character and social inferiority group. In the oral and anal phases there were essentially group fixations, not single. The schizophrenic fixation was an omnibus fixation and had components from both introjective and projective sides. Compulsive neuroses were obviously autoplastic, but some phobias had a paranoid element. Drug addictions were on the borderline between psychoses and neuroses, but on the whole, the term "borderline" was unsatisfactory, and the term "potential psychosis" was preferable.

DISCUSSION.

The CHAIRMAN said that the history of psychiatric classification was strewn with wrecks, and he

welcomed the search for a classification that, while not a mere pigeon-holing, endeavoured to study the actual causal factors determining reaction types.

Dr. DAVID FORSYTH said that he had never been able to regard the oral-libidinal as necessarily preceding in time the anal-libidinal primary; the child must experience both from the very beginning of life. The "oral" child became a much pleasanter, more educable and extraverted type of child than the "anal" type. It was a matter of very great importance which zone came to occupy the child's chief interest.

Dr. MARGARET LOWENFELD asked whether any research had been done in relating later developments with early life-histories in this connexion: for instance, the subsequent fate of children who had at first refused to suck, thus throwing great stress on the anal experience, and the relation of subsequent speech defects to oral impulses in the earliest days.

Dr. HENRY YELLOWLEES said that Dr. Glover's views dealt a death-blow to the belief that neuroses were in any sense halfway houses to the psychoses. The objection to this classification was that no case could be assigned to its class without elaborate investigation; it did not help the clinical worker.

Mrs. MELANIE KLEIN said that the effect of a good sucking stage could be observed to influence the subsequent development, modifying the sadistic impulses.

Dr. GLOVER, in reply, pointed out that the primacies were cross-sectional views, and at each cross-section one interest would be found predominating. In longitudinal section they would be found overlapping, and one influenced another, the anal being largely conditioned by frustration of the oral, for instance. He thought his scheme, while appearing at first sight impracticable, might lead to much combined research between clinicians and psychoanalysts. Psychiatrists had got off too easily in the past; their classification compared with the stage of organic medicine in which diseases were classified by the region in which symptoms appeared—the head, the leg, the belly, and so on. The physician did not find the modern complex classification impracticable, because he had got used to it.

MEDICAL SOCIETY OF LONDON.

Mr. HERBERT TILLEY took the chair at a meeting of this society on Feb. 8th, and Mr. HAROLD DODD opened a discussion on the

Toxic Syndrome of Chronic Cholecystitis.

He said that the condition was more common than was generally realised, and that it formed an appreciable proportion of the obscure conditions classified by Mackenzie under the two headings of diseases recognised by a single symptom and diseases with uncoördinated symptoms. The incidence favoured women in the proportion of two to one. He differentiated sharply between chronic cholecystitis and gall-stones, which were often a late sequela. Many of the ailments in the syndrome might appear to be quite unrelated, like the parts in a jig-saw puzzle. The family history sometimes showed near relatives suffering from similar conditions. The trouble could often be dated from the birth of a child, a severe febrile disease, or a long history of bilious attacks, sometimes dating from infancy. In some cases there was a history of maternal ill-health during pregnancy. Jaundice occasionally occurred.

Unpleasant changes in the sleep were constant; all the patients were nervous and dreadfully miserable. Neurasthenia was prominent and especially common in single business women of about 30. Irritability and giddiness were general. The headache was characteristic, usually across and deep behind the eyes, sometimes in the occipital area or nape, or in the frontal region towards the vertex. Breathlessness was often prominent, occurring after exertion and food and in the night. It was sometimes associated with sensations of suffocation or a deep aching pain in the upper part of the right chest. Some cases of asthma were relieved by a gall-bladder operation. Pain, discomfort, and catches in the breath at the right costal margin and the right lower intercostal spaces were frequent and might be the chief symptoms. Palpitation and thumping of the heart were common and might be accompanied by pain about the heart. Patients of any age or sex might have cold shivers or hot flushes, and all were very susceptible to changes of temperature.

Among the alimentary symptoms were capriciousness of appetite and nausea. Patients could not take fatty or acid food, and ultimately reached a stage when bread and butter and boiled fish were the only foods which did not provoke severe indigestion. Many complained of a dry mouth with a nasty taste, which might lead to air-swallowing. Soon after taking food, discomfort grading to severe pain occurred in the epigastrium; at first only after the chief meal of the day, but later after every meal. Flatulence was outstanding and distressing in all stages of the disease. Some patients had hæmatemesis. Periods of freedom from pain gradually became shorter until there might be daily discomfort and two or three attacks of pain in a fortnight. The pain occurred one to three hours after food and might awaken the patient at night. It was sometimes associated with a small duodenal ulcer, always situated on the anterior wall half an inch from the pylorus. Constipation was usual. Scalding and sometimes frequency of micturition occurred on and off. Rheumatism and neuritis were common complaints, occurring in all parts of the body. The general strength was usually much lessened and, in the later stages, loss of weight was the rule. Occasionally the thyroid was symmetrically enlarged, less often irregularly. Symptoms increased at the menstrual period in a considerable number of patients.

The physical signs included an appearance of tiredness and anxiety. The eyes were distinctive: they appeared watery, with muddy sclerotics and slight injection of the conjunctival muscles. Moskowicz's sign—dilatation of the right pupil when the eye is at rest—occurred fairly often. The skin was usually of a greyish-bronze or sallow colour. Hyperæsthesia was present in 75 per cent. of patients, and tests for it helped to localise the site of the toxic focus; it was usually over the right half of the abdomen, occasionally in the right iliac fossa, and, in the back, below the angle of the right scapula to the crest of the ilium. Boas's sign was reliable: tenderness on pressure over the right costo-vertebral angle; sometimes this pressure evoked also the ordinary pain and flatulence. The tension of the back muscles between the twelfth ribs and iliac crests was often unequal. There was usually tenderness over the gall-bladder area, in the right rectus and in the right iliac fossa; often also in the left iliac fossa, probably due to spastic colon. Piles were

common. A positive radiogram was not necessary. The barium meal might show a change in gastric tone or emptying rate, an irritable duodenum and occasionally a pathological appendix. In time early cases might be treated medically, but at present operation was confidently advised. Improvement began immediately, and convalescence lasted for 6 to 12 months with occasional slight relapses. A holiday was very desirable, and sedatives and vitamin-containing preparations should be prescribed.

Mr. Dodd described the anatomy and neurology of the gall-bladder, and also the appearance of a diseased gall-bladder on the operating table.

THE PATHOLOGICAL ASPECT.

Dr. ARTHUR DAVIES said that most specimens showed definite histological signs of medical cholecystitis: the mucosa was œdematous and the wall was infiltrated with lymphocytes, histiocytes, plasma cells, and young fibroblasts, and there were inflammatory changes in the subserous layer. His impression was that in the majority the route of infection had been the blood stream. The specimens showed sinuses formed by the pouching of the mucosa into the muscular tissue; in one case small gall-stones were found in the interstitial substance. In 12 per cent. there were definite indications of strawberry gall-bladder. In a number there was no evidence of histological change; he believed that in some gall-bladders change of function must occur without change of structure.

Dr. CHARLES MILLER said that the gall-bladder might be blamed for certain cases of urticaria, asthma, migraine, and gall-bladder dyspepsia. There was a constant difficulty in determining the relationship between pain produced by the gall-bladder and pain produced by the heart—between angina pectoris and gall-bladder colic. The quality of the pain might be almost identical, and the similarity might be due to an origin in the same region of the central nervous system. From a study he had made of the post-mortem records of 350 patients at the London Hospital with gall-stones or cholecystitis, he had found an excess and earlier incidence of atheroma in patients with gall-bladder disease. Chronic gall-bladder disorder might therefore produce especially severe cardiac symptoms in a middle-aged heart that was more degenerated than it should be, and these symptoms might be relieved by cholecystectomy.

THE RADIOLOGICAL ASPECT.

Dr. G. E. VILVANDRÉ stated that in careful hands with proper technique at least 70 per cent. of gall-stones could be shown by the radiologist. The dye test might fail to reveal a pathological gall-bladder, but a visible gall-bladder, whether it had stones or not, was pathological. Negative radiological evidence was worth nothing. A good clinical history was a valuable aid to the finding of gall-stones. Investigation of the gall-bladder should be an essential part of every routine gastro-intestinal examination.

Dr. J. R. WYLIE described his radiological research into early duodenal ulcer before the appearance of deformity; these "observation" cases might present a difficulty of diagnosis from cholecystitis. This class of case had no ulcer crater, but a regular peristaltic action in the first stage of the duodenum, with considerable tenderness. The peristalsis had until recently been put down to a reflex action from the appendix or an inflamed gall-bladder, but the speaker thought that there might be a typical local lesion in the duodenum. The only reflex action that he could associate with the gall-bladder was a pyloric spasm.

Mr. ZACHARY COPE suggested that Mr. Dodd's jig-saw puzzle could be put together to form several alternative pictures. There was probably no one present who had not had one part of the syndrome, but if all the syndrome had to be present, then probably no one had it. He asked for a more precise definition of the syndrome. It was very difficult to associate this syndrome with serious demonstrable organic disease of the gall-bladder. The syndrome was seen in the neurasthenic type, which Mr. Dodd had put down as neurotic—a very dangerous generalisation. The same symptoms had been attributed to chronic intestinal stasis. The essential point of criticism was that in many cases with the symptoms described the liver was at fault. Many patients relapsed some months after operation. Mr. Cope said that he would have been more convinced if he could have known the state of the liver of Mr. Dodd's patients, and the state of the patients five years ago.

Mr. A. J. WALTON urged the necessity for great care. It was now becoming fashionable to remove the gall-bladder, as it had formerly been to remove the appendix or fix the colon. He believed that a large number of cases with the syndrome Mr. Dodd had described were obscure cases of hepatitis; they might be pathological cholecystitis, but were certainly not surgical cholecystitis, and were readily cured by medical means. It was necessary to strike a balance between credulity and disbelief in the value of the cholecystogram. He would remove a gall-bladder only if it had lost its normal colour and was definitely thickened to the feel or contained gall-stones.

Dr. W. LANGDON BROWN asked what was the irreducible minimum of the symptoms for a positive diagnosis. He thought that many of Mr. Dodd's cases could have been cured without operation, and doubted whether all had really had cholecystitis.

Dr. A. H. DOUTHWAITE said that a large proportion of Mr. Dodd's hyposthenic type were suffering from visceroptosis, and could be cured by exercise and ordinary medical treatment. Cholecystitis could be treated by draining the gall-bladder and abdominal exercises. He challenged Mr. Dodd to a contest between these methods and surgery. The hyposthenic person was liable to angina, and the confusion between this and cholecystitis often gave rise to mistaken diagnosis. Nevertheless, there were patients with angina whose gall-bladders were abnormal radiologically and who benefited by their removal, probably because they were a toxic focus.

Dr. C. E. LAKIN asked if the specimens had been examined bacteriologically.

Dr. CHARLES NEWMAN said that the syndrome fitted the gall-bladder dyskinesias, and described recent work done on the Continent. Diagnosis was easy by duodenal intubation and the test with pituitary extract and olive oil, and the medical treatment was simple and effective.

Mr. DODD, in reply, promised a later report on the progress of the patients. He required the physical signs to be definite before he operated. On an average, four to six of the groups of symptoms—nervous, respiratory, cardiac, alimentary, urinary, and locomotor—should be represented. He doubted Mr. Walton's assertion that many patients could be treated medically. Dieting was impracticable because the patients could hardly retain any food.

Dr. DAVIES replied that unfortunately no bacteriological investigation had been done.

REVIEWS AND NOTICES OF BOOKS

The Laboratory in Surgical Practice.

By E. C. DODDS, M.V.O., M.D., Professor of Biochemistry, University of London; and LIONEL E. H. WHITBY, C.V.O., M.D., M.R.C.P., D.P.H., Bacteriologist to the Middlesex Hospital. London: Constable and Co., Ltd. 1932. Pp. 187. 8*s.* 6*d.*

WE welcome this, the first of a new series under the general editorship of Gordon Taylor, because it fills a need. Hitherto if surgeons have desired to obtain information on the numerous tests employed in their work, they have had to consult the scattered literature or large technical laboratory manuals. Here, in simple language, Prof. Dodds and Dr. Whitby have described and explained the methods of performing such tests as those of renal function, blood grouping, and basal metabolism. They have ably summed up the occasions when such tests are called for and likely to give useful information, and the significance of the results that may be obtained. The sections on cholecystography and intravenous pyelography are especially useful, and those on the uses of serums, vaccines, and the bacteriophage are very informative.

We commend the book both to working surgeons and to members of laboratory staffs.

Der Mineralbestand des Körpers.

By WOLFGANG HEUBNER, Professor in Heidelberg. Berlin: Julius Springer. 1931. Pp. 94. R.M.8.50.

THE proportion of mineral constituents in the bodies of vertebrates is small in proportion to the so-called organic matter—in man it is about 4 per cent., as measured by the ash left after incineration. About a quarter of this is associated with the soft tissues and body fluids, the remainder being in the bones. Prof. Heubner's book, which is a reprint of the chapter of the same title in the "Handbuch der normalen und pathologischen Physiologie, Bd. XVI/2" is a useful up-to-date summary of our present knowledge of the significance of the inorganic constituents of the body. In his introductory chapter he calls attention to the interesting fact that, small as is the mass of mineral constituents relative to the "organic"—e.g., the proteins—yet, owing to the enormous molecular (or micellar) weights of the organic matter (multiples of 35,000), the molar concentrations are often greater. Thus the concentration of hæmoglobin in the blood corpuscles is 0·02 molar, whilst that of chlor-ions in the plasma is 0·1 molar.

Brief sections deal with the anions and kations in the blood and other body fluids. The remarkable excess of bases over acid radicles (recognised as such) in blood which has variously been attributed to the acidic properties of proteins and the presence of unknown acids is discussed. The author says truly: "Es ist von grundsätzlicher Wichtigkeit dass die Frage der Absättigung des Basenüberschusses im Blutplasma durch weitere Untersuchungen zu endgültiger Klärung gebracht wird." Sections follow on the mineral content of the blood corpuscles, of the whole blood, and of the solid tissues of the body.

It is remarkable that whilst the composition of the ash of the blood plasma of all mammals is very similar (although in amphibians more dilute than in land animals), the ash content of the corpuscles varies among different animals, and is characteristic for each kind.

Prof. Heubner alludes to the elements, such as copper, manganese, iodine, vanadium in various ascidians, which, although present in very small quantities in the fluids or tissues of the body, appear to have important functions in maintaining it in a state of health. He mentions interchangeability of certain elements—strontium will to some extent replace calcium in the bones and bromine will take the place of some of the chlorine—but refrains from a full discussion of the rôle of these interesting constituents of the body.

This concise work forms a valuable handbook for those interested in this branch of biochemistry. A copious bibliography is supplied in footnotes.

A Text-book of Exodontia.

Second edition. By LEO WINTER, D.D.S., Professor of Oral Surgery, New York University College of Dentistry. London: Henry Kimpton. 1931. Pp. 455. 42*s.*

THE term exodontia was coined in America as a substitute for the more homely expression, extraction of teeth, current in this country. Several books on this subject have been written by American dental surgeons within the last few years. This book is a fair but not outstanding specimen. It is a safe guide as far as it goes, but in spite of its length many omissions are apparent—for example, post-operative treatment, which from a practical point of view is of paramount importance. An operation such as the removal of an impacted lower third molar may be one of considerable severity. The after-pain may be great, and the success of the operation in the eyes of the patient is largely conditioned by the ability of the operator to control this pain. Very little is said by Prof. Winter on this aspect. A few drugs are recommended, but no hints are given on the value of frequent irrigation, the use of heat or cold, counter-irritation, or other devices.

In discussing the treatment of impacted upper canines the author shows a marked preference for the palatal route. Where the canine is close to the palate, as is often the case, this route is obviously indicated. But when a canine involves the antrum or the nasal fossa, there is much to be said for using the alveolar path. In connexion with the treatment of infected lower third molars, infiltration injection is rightly condemned on the grounds that the injection would necessarily be made into an infected area. We cannot, however, agree with the advice to use conduction anæsthesia, for the needle would have to be inserted close to the inflamed area, and though less the risk of infection would still exist; a general anæsthetic avoids this danger. No mention is made of the removal of the upper third molar as a speedy means of relieving the pain from an infected lower third molar. This is not always effective, but in many cases much of the pain is due to the fact that the upper molar bites on the inflamed and thickened pad of gum overlying the lower molar. The extraction of the upper tooth is a simple matter and may relieve the pain so as to enable removal of the lower molar to be delayed until the inflammation has subsided. We note with interest that Prof. Winter regards the removal of a lower second molar as a

means of relieving the impaction of a third molar, as malpraxis. Some dental surgeons hold with him that an impacted lower third molar must itself be removed at any cost; others tend to deal with every case of impaction by the routine removal of the second molar. The first group inflicts on the patient a long, tedious, and often painful operation, which might sometimes be avoided by the simple removal of the anterior tooth; the second group may deprive the patient of a useful tooth without removing the infected one, or eliminating a source of infection which may continue to give rise to trouble. In our view both methods of procedure have their place, according to the conditions which may be present.

The last chapter, on the removal of cysts, leaves much to be desired. Nothing is said of those cysts, not uncommon, which impinge on the antrum without opening into it. The removal of the lining membrane, as advocated by the author, would involve the antrum in these cases, and it is far better practice to leave the lining in the deeper part of the cyst intact. Provided that a sufficiently large opening has been made, there is no fear of recurrence. The closed method of operation in which the flaps are sutured after removal of the cyst is not mentioned. It cannot be carried out in all cases, but when suitable it is an excellent method. It is curious that the only section in the book devoted specifically to the treatment of post-operative pain follows this chapter. Yet after-pain is uncommon following the removal of a dental cyst, provided that free drainage has been established and that all sharp edges of bone have been smoothed away.

The book is lavishly illustrated with pictures of high quality. The various steps of different operations are clearly depicted, and the illustrations should prove of much help to the reader.

Rheumatoid Arthritis and its Treatment.

By VINCENT COATES, M.C., M.A., M.D. Cantab., M.R.C.P. Lond., Consulting Physician, Trowbridge and District Hospital; Physician, Royal Mineral Water Hospital, Bath; Cardiac Specialist to School Medical Service, Wilts County Council; and LEO DELICATI, L.M.S.S.A. Lond., Resident Medical Officer, Royal Mineral Water Hospital, Bath. London: H. K. Lewis and Co., Ltd. 1931. Pp. 114. 6s.

THE speed with which literature on the subject of rheumatism and arthritis is accumulating makes it impossible for the busy practitioner to keep pace. He will therefore be glad to know of this small book, which in 114 pages gives him useful and practical information. The Royal Mineral Water Hospital, Bath, provides a wealth of clinical material and a very fruitful field for observation, and it has been quite easy for the authors to collect 100 consecutive cases of rheumatoid arthritis, all of whom are resident in the hospital, and to investigate them along certain lines, with a view to forming an approximate idea of the frequency of clinical and biochemical syndromes. The book, which treats of this disease only from the therapeutic point of view, is arranged in sections. The opening chapter deals with the vexed problem of classification, and although the authors do not get much nearer to the solution of this problem, at least they define clearly what they themselves understand by rheumatoid arthritis. The second chapter contains a clinical description of the disease, which includes an interesting short history of the "subcutaneous nodule." Certain biochemical obliquities and their interpretation are next described, after which an account is given of systemic treatment along definite lines. This is probably the most valuable section in the book, which is concluded by descriptions of a number of instructive cases. This work does not set out to be an exhaustive treatise, but a description of principles and methods which, in the authors' hands, have been found useful in the treatment of rheumatoid arthritis. It will be appreciated both by practitioners and medical students.

Practical Physiological Chemistry.

Tenth edition. By PHILIP B. HAWK, M.S., Ph.D., President of the Food Research Laboratories, Inc., New York City; and OLAF BERGEIM, M.S., Ph.D., Associate Professor of Physiological Chemistry in the University of Illinois, College of Medicine, Chicago. London: J. and A. Churchill. 1931. Pp. 929. 30s.

THIS book was originally published in 1907, but since then such rapid strides have been made in this subject that this volume will be found to contain about five times as much material as the first volume. Many of the chapters have been entirely rewritten or revised, and the advice of other experts has been requisitioned by the authors in bringing the various sections up to date. Basal metabolism is dealt with at length, as are problems in connexion with blood, urine, and gastric analyses. The section on proteins has been considerably extended, and much space has also been devoted to a consideration of vitamins and deficiency diseases. In places where only a very brief outline of the subject is given—as, for example, in the chapter on the endocrine organs—many references have been supplied to indicate where more comprehensive information can be obtained. There are nearly 300 illustrations, which greatly add to the value of the text, and there is also a very useful appendix on reagents and solutions.

The book is already so widely known and appreciated that it is hardly necessary to praise the excellent way in which the author has managed to include so much of value and interest in a comparatively small volume.

The Surgeon.

By C. JENNINGS MARSHALL, F.R.C.S., M.S. London: Geoffrey Bles. 1932. Pp. 129. 3s. 6d.

THIS contribution to the Life and Work Series is written by a surgeon to a large teaching hospital who has therefore had every opportunity to reinforce his learning both by the clinical opportunities enjoyed and the necessity of imparting its essentials in simple terms to students. Here the students are the public, and the information to be given is not concerned with the practice of surgery (which must be the surgeon's job and only surgeons can appraise it) but with the relations that surgery bears to those who are to benefit by its practice. Mr. Marshall's brief exposition of the training required to make a surgeon and of the meaning of surgery; his analysis of the situations when operation should be advised; his remarks upon ethics and orthodoxy; and his historical deductions make up a small book that will be read with advantage by all men and women who wish to understand the problems, the difficulties, and the successes of modern surgery.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 13, 1932.

B C G AND LÜBECK.

THE long drawn out trial of Dr. GEORG DEYCKE and his colleagues at Lübeck in connexion with the Calmette-Guérin vaccine has at last reached its end—an end which is tragic for Prof. DEYCKE who, now no longer young in years, has spent a lifetime in disinterested service to bacteriology. The events which led up to the trial can be summed up in a few words. During the winter of 1930–31 253 infants in Lübeck were given by the mouth B C G vaccine subcultured from cultures received from the Pasteur Institute in Paris; within some three months 68 had died of acute tuberculosis, and doubts arose as to the nature of the vaccine. Broadly speaking, there were two possibilities. Had B C G, a non-virulent bovine strain of tubercle bacillus, suddenly acquired virulence, or had another strain of tubercle bacillus accidentally gained access to the vaccine? After exhaustive investigations the German courts have decided that the latter is the explanation, thereby vindicating the reputation for non-virulence of B C G, but involving Prof. DEYCKE in the responsibility, which as head of the laboratory he must accept, for the accidental admixture of virulent cultures with the vaccine. The final stage in the trial is reported by our Berlin correspondent on p. 365 of our present issue.

The questions raised by this calamity are no mere academic quibbles. The B C G vaccine has been broadcast so extensively that any bacteriologist, and indeed any clinician, may find himself suddenly confronted with the decision, whether or not he should recommend its use. We need not recount all the stages in the development of B C G by CALMETTE and his co-workers at the Pasteur Institute. They have been set out diligently in these columns. It is perhaps a little unfortunate that what may be called practical clinical flank of this prophylactic army was allowed to march ahead of—we had almost said get out of touch with—the bacteriological research flank. On the practical side it can be claimed that several hundred thousand infants and children have received this vaccine and that (apart from the Lübeck tragedy) the recorded deaths have been few and, as far as could be ascertained, not attributable directly to the vaccine. How far these infants have been protected from clinical tuberculosis can only be computed by the calculation of probable risks, and the variable factors are so many that this calculation cannot be worked out with any degree of certainty. On the purely bacteriological side the researches of various workers (PETROFF, MALKANI, DREYER and VOLLUM, and others) have suggested that a return to virulence on the part of the B C G strain is not impossible. The answer to these experiments has been that the conditions of cultivation on bile potato laid down by CALMETTE and GUÉRIN have been so altered that an entirely new set of circumstances has been created, or alternatively, that some workers have not been sufficiently careful in guarding against contamination of their cultures with virulent strains of the tubercle bacillus; whilst in at least one instance experiments made by one school have been repeated seriatim by another with opposite results. We cannot here thread our way through all these controversial points. In our last two issues, however, have appeared the records of a painstaking investigation in the Cambridge Field Laboratories by Dr. A. STANLEY GRIFFITH, which does much to clear the air. He has found that although B C G can produce tuberculous lesions in guinea-pigs, monkeys, rabbits, and goats, these lesions have no progressive tendency, and after a time heal or become obsolescent. The culture of B C G with which he has worked has retained its cultural characteristics and has not increased its virulence after continuous cultivation for eight years on media, such as egg, which in some hands have produced virulence. He concludes by supporting the contention of CALMETTE that B C G may be used as a vaccine without risk of causing progressive lesions.

This is the crux of the matter. Bacteriologists can be left to settle the academic points of the B C G controversy at their leisure; the real points at issue are (1) whether the administration of a vaccine of a living but non-virulent strain protects in a way which a vaccine of dead organisms cannot; (2) whether there are risks inherent in the use of living-culture vaccines which cannot be guarded against with reasonable precautions in a well-organised laboratory; and (3) if there are such risks, whether the dangers of tuberculosis in infancy are so great that the risks of the vaccine going wrong are worth taking. The first question is a bacteriological one which has been partially answered by Dr. GRIFFITH'S work in our current issues. The B C G strain wanes and finally dies, but in so doing creates antitoxins in animal tissues. We are not quite sure that the method of administration of the vaccine to goats and other animals is strictly comparable to that usually followed by the clinician. It is conceivable also that there is a wider variation in the constitutional powers of infants under modern conditions of life than occurs amongst even domesticated goats and rabbits. We must not be content to admit that B C G vaccine administered to infants has done no harm—Lübeck apart; we must be convinced that it has definitely conferred a valuable measure of immunity. Turning now to the second question, can the bacteriologist ensure that no untoward accidents shall happen to the living vaccine so that it shall never contain virulent organisms? At Lübeck certain important precautions were not taken, and the verdict of the court reflected the views of those who sat in judgment as to the seriousness of the neglect. Before B C G vaccine is extensively used in this country it is to be hoped that an expert committee of bacteriologists will

be asked to decide this question. The Therapeutic Substances Act was framed so carefully as to cover such potentially dangerous material as a living virus, but B C G is not sold like an ordinary vaccine to all who come, but is given away, and the Act does not look such a gift horse in the mouth. As to the third question, the mortality from infantile tuberculosis in this country is high enough to warrant risks, but it is steadily falling. Moreover, in the majority of cases, the disease does not swoop down like a wolf on the fold. B C G has been considered by some an analogous case to calf lymph; but tuberculosis is not like small-pox. There are other remedies, and the outlook is not necessarily black or even grey. These factors have to be reckoned with in deciding whether we shall take risks, and if so how much; the ills we know may be more tolerable than the others that we know not of. And lastly, the risks of infection in tuberculosis persist for some years; if not from childhood to the grave, at least from infancy to manhood. We do not know how long B C G protects, nor whether repeated applications of the vaccine will produce the desired results. Festina lente is not necessarily the counsel of despair; it may be the wisdom of sanity.

VARICELLA AND ZOSTER.

THERE can be little doubt that, were it not for the lack of a suitable experimental animal, the question of the relationship of the viruses of varicella and zoster would have received a definite answer by now. Ever since J. VON BOKAY first put forward the conception of a common ætiology for one type of zoster (zoster varicellosus) and varicella, clinical evidence that zoster gives rise to chicken-pox in susceptible contacts has been steadily accumulating. Some of this evidence, such as that produced by P. J. BRASLAWSKY [1] and P. F. ARMAND DELILLE and Madame TROCMÉ,[2] for instance, has almost the value of a controlled laboratory experiment. And the chain of circumstantial evidence supporting this conception has been considerably strengthened by the serological studies of NETTER and his colleagues; in fact, on the strength of cross complement-fixation reactions, NETTER considers that all cases of zoster, idiopathic and symptomatic, are caused by the virus of varicella. In a recent paper by E. BRUUSGAARD,[3] which starts with a critical and unbiased review of the situation, some experiments on children are described. KUNDRATITZ,[4] he says, reported that young children who had had neither zoster nor varicella, could be infected by dermal inoculation with zoster vesicle fluid, the result being a local vesicular lesion followed, in some instances, by a generalised vesicular eruption indistinguishable from chicken-pox. Children who had had chicken-pox were refractory to the zoster inoculation, and those who had recovered from experimental zoster were not susceptible to the local implantation of chicken-pox vesicle fluid. BRUUSGAARD'S findings are in keeping with those of KUNDRATITZ. Eighteen children were inoculated in the skin with zoster vesicle fluid and eight showed "takes." In four of these there was a local response only, but in the other four there was a generalised eruption indistinguishable from chicken-pox. Further, he was able to transmit the condition by inoculation from one case, and in several instances clinical varicella developed in susceptible children placed in contact with the experimentally infected ones.

Findings such as those of KUNDRATITZ and BRUUSGAARD are very strong evidence that the causal viruses of these two diseases are identical; in fact, it is difficult to see what other interpretation to put on them. Against this conception has been advanced certain epidemiological evidence. Chicken-pox is a disease of childhood, whereas zoster occurs principally in adults. Both diseases apparently confer a lasting immunity, yet it is common for zoster to occur in a person who had varicella in childhood. At first sight these facts are at variance with the idea of a common ætiology for these two diseases, but is this really so? The available evidence suggests that in virus diseases which confer a lasting immunity there is a persistence of the virus in the body; a state of armed neutrality, so to speak. And if this is so, where more likely for the chicken-pox virus to persist than in the central nervous system, where it would be less exposed to the action of viricidal antibody? Later on in adult life, when the immunity acquired from the attack of chicken-pox might be waning, any factor exciting a deleterious action on the central nervous system (trauma, tumours, and poisons such as arsenic and bismuth in symptomatic zoster; unknown in idiopathic zoster) would light the dormant virus into activity giving us the disease zoster. The virus would track to the skin via the spinal nerves, and any subsequent tendency to generalisation would be held in check by the residual chicken-pox immunity. Admittedly this is pure hypothesis, and is not in keeping with the statement that zoster occurs in isolated communities where chicken-pox is unknown—an observation which may not necessarily be correct. But it does help to bring into line conflicting clinical, epidemiological, and experimental evidence, and might conceivably be of service as a working hypothesis in future investigation.

[1] Presse Méd., Nov. 14th, 1931, p. 1671; see THE LANCET, 1931, ii., 1199.
[2] Bull. et mém. Soc. méd. hôp. de Paris, Jan. 25th, p. 48.
[3] Brit. Jour. Derm. and Syph., 1932, xliv., 1.
[4] Monat. f. Kinderheilk., 1925, xxix., 516.

AURICULAR FIBRILLATION.

IN an attempt to throw further light on the cause of this form of cardiac failure, D. MCEACHERN and B. M. BAKER [1] have studied a series of 575 patients with auricular fibrillation seen at the Johns Hopkins Hospital in the past 12 years. Electrocardiographic evidence of the arrhythmia was obtained in all cases. The largest ætiological group was composed of those suffering from rheumatic heart disease, who formed about 34

[1] Amer. Jour. Med. Sci., January, 1932, p. 35.

per cent. of the total. Cases considered arteriosclerotic in origin amounted to 31 per cent., while those in which the heart failure was consequent upon hyperpiesia were 17 per cent. of the whole series. The differentiation of the last two groups is admittedly difficult, and McEACHERN and BAKER take a blood pressure of 150 mm. of mercury as the arbitrary dividing line. If, however, the two categories are added together as "non-rheumatic," they make the largest group in the series—namely, 48 per cent. of the whole. Hyperthyroidism was responsible for some 7 per cent. of the cases, and 5 per cent. were found to be associated with chronic disease of the lungs. In only 3 per cent. was cardiovascular syphilis the causal factor—despite the fact that syphilitic aortitis is recognised in over 15 per cent. of all the patients admitted to the hospital with heart disease. The remaining 2 per cent. fall into a miscellaneous group of uncertain ætiology.

These figures are very similar to those given by W. D. STROUD, L. B. LAPLACE, and J. A. REISINGER,[2] who have made a parallel study of 253 cases of auricular fibrillation seen in Philadelphia. (Rheumatic, 48 per cent.; "non-rheumatic," 35; syphilitic, 9; thyrotoxic, 3·5; miscellaneous, 4·5.) The low incidence of cardiovascular syphilis as a cause of auricular fibrillation is striking especially in the first series, and it is noteworthy that of 100 cases of luetic heart disease studied by A. FRIEDLANDER[3] in Cincinnati, fibrillation occurred in only ten. McEACHERN and BAKER consider that in nine of their 14 cases of syphilitic aortitis auricular fibrillation was produced by administration of digitalis, and in five of these normal rhythm returned on discontinuance of the drug. They report two fresh cases of fibrillation in children under 10, both of whom were suffering from rheumatic carditis, and in a review of published information on this condition in childhood they suggest that in some, at any rate, of the reported cases the fibrillation may have been induced by digitalis therapy. With regard to prognosis both groups of investigators agree about the grave outlook in auricular fibrillation in childhood, the subsequent duration of life being less than a year in both groups. Of the cases reported by STROUD, LAPLACE, and REISINGER, in which the fibrillation was the result of cardiac rheumatism, in 86 per cent. fibrillation began before the age of 40, and in 88 per cent. the patient was dead before the age of 53. In the arteriosclerotic group, however, the incidence was much later, 72 per cent. of the patients not fibrillating until after the age of 53. The duration of life after the onset of fibrillation they find to be roughly the same in the rheumatic and "non-rheumatic" groups, being two and a half years for those patients now dead, and three and a half for those still living; the maximum duration of life after the onset was 16 years in the first group and 14 years in the second. In most of the thyrotoxic cases normal rhythm returned spontaneously after partial thyroidectomy, but in the syphilitic patients with fibrillation the prognosis is bad, the average duration of life being only two years.

Although STROUD and his co-workers have previously reported favourably on the value of quinidine in the treatment of auricular fibrillation, they are now less enthusiastic about it. The patients successfully treated with this drug were specially selected, and had a minimum of detectable myocardial damage, with little or no sign of congestive failure; yet the average duration of life from the onset of fibrillation was in these cases exactly the same as in those which were considered suitable for treatment with quinidine but failed to react, and only little more than a year longer than in those considered unsuitable for this treatment. Moreover, more than half the cases successfully restored to sinus rhythm by quinidine reverted to fibrillation within 12 months. They further find that patients efficiently treated with digitalis are not less comfortable than those in whom normal rhythm has been restored with quinidine, but the latter are anxious and apprehensive lest the fibrillation should return. They therefore conclude that the most beneficial results in auricular fibrillation are obtained with digitalis, and that quinidine should be reserved for a few selected cases in young people with little or no other evidence of cardiovascular abnormality.

[2] Ibid., p. 48.
[3] Amer. Heart Jour., October, 1931, p. 15.

GIFT OF AN INFECTIOUS DISEASES HOSPITAL.

FOR many years past the corporation of Wakefield have had under consideration the provision of a new hospital for infectious diseases, and a few months ago proposals were put forward for its erection at a cost of £71,000, including £4500 for the site. On grounds of economy the scheme was abandoned, and it was decided to spend £5000 on repairing and slightly extending the existing institution. A resident of Wakefield, who makes anonymity a strict condition, has now offered to provide £61,500 for the new hospital, being the entire cost less the £5000 the Council intended to spend, and £4500 the value of the site, already owned by the town. The new hospital, which had been completely planned, will have 89 beds and a theatre. There will be two 24-bed pavilions, a cubicle block of eight beds, a tuberculosis block of 16 beds, a diphtheria pavilion of 17 beds, and the necessary administrative accommodation.

THE Milroy lectures of the Royal College of Physicians of London will be delivered on Feb 18th, 23rd, and 25th, by Prof. Cyril Okell, on the Rôle of the Hæmolytic Streptococci in Infective Disease. On March 1st, 3rd, and 8th, Dr. L. J. Witts will give the Goulstonian lectures, on the Pathology and Treatment of Anæmia. Dr. C. E. Lakin's Lumleian lectures will be delivered on March 10th, 15th, and 17th, and their title is the Borderlands of Medicine. Later in the year Miss Harriette Chick, D.Sc., will give the Oliver-Sharpey lectures, on the Relation of Light to Nutrition (May 3rd and 5th), and Dr. J. W. McNee, the Croonian lectures, on the Liver and Spleen and their Clinical and Pathological Associations (June 2nd, 7th, and 9th). All these lectures are to be given at the College at 5 P.M. Members of the medical profession are admitted on presentation of a visiting card.

ANNOTATIONS

SOIENCE AND THE MEAT INDUSTRY.

THE indebtedness of the meat industry to science is set out by Dr. T. Moran in the issue of *Chemistry and Industry* for Jan. 29th in an essay which makes useful reading. The transport of meat from the other side of the world to this country, which is the subject of Dr. Moran's reflections, is a triumph of the application of scientific research. Frozen mutton at a temperature in the region of —10° C. is brought to us on a 40-day journey from Australia; the shorter journey from South America, 18 to 25 days, permits of the transport of beef in the chilled state—i.e., at a temperature equal to or slightly below the freezing point of the tissue, roughly —1° C. Owing to its close resemblance to home-killed meat chilled meat as an article of commerce commands a higher price than the same meat when frozen, so that the experiments now being made with the object of bringing mutton in the chilled state from Australia have an economic reason. But on arrival in this country chilled meat, being much more perishable than frozen meat, must be sent to the markets for immediate sale; the vast bulk of frozen meat, on the other hand, is perfectly wholesome after storage for a year or more at —10° C., the growth of micro-organisms ceasing at about —7° C. A certain amount of spoilage occurs owing to oxidation of the fat; lower fatty acids are formed, and, what is more important, aldehydes which impart an unpleasant taste to the fat; bacon suffers especially, and cannot be kept satisfactorily for long periods in cold storage. Investigations made by the Food Investigation Board seem to point to the harmful influence of light. The comparatively short distances between the ports and points of retail in this country make it sufficient for imported chilled and frozen meat to be despatched by road or rail from the docks or markets in insulated vans or containers. For the railway journey from Aberdeen to London, which may afford as an example of the longest journey in Great Britain taken with a commercial objective, a railway van was equipped, as an experiment, with a self-contained refrigerating plant. Methyl chloride was used as the refrigerant; the pump was driven off the axle and the vessel containing the refrigerant was immersed in brine drums containing potassium chromate brine, which has a freezing point of —11·3° C. During stoppages the drums provided a reserve of cold.

Present-day knowledge does not permit of any distinction being made between the actual nutritive value of home-killed, chilled and frozen meat, but there is the all-important question of flavour. The palatability of the flesh is largely dependent upon the breed of the animal. From South America the best quality meat exported is chilled and the lower quality frozen. It is quite possible for imported chilled meat to be superior in flavour to home-killed meat, but to the refined taste the flavour of the best Scotch beef surpasses that of the best chilled beef. Any application of science which makes the appearance of frozen meat approach more closely to that of home-killed meat is appreciated by the meat industry. Frozen meat drips on thawing and the hæmoglobin from the blood is suffused into the neighbouring fat, giving it a pink tinge. It has been found, however, that if the rate of freezing is sufficiently rapid the drip is negligible. This rapid rate can only be realised with small thicknesses of tissue—e.g., steaks and small joints—and then by some special technique, such as freezing in cold brine.

Much is expected from the result of recent investigations on the conditioning or ripening of beef. Meat of inferior quality when kept in cold storage, especially in the form of sides or quarters, increases in palatability and tenderness. This is due to a change in the chemical basis of the connective tissue, collagen, which is readily converted into gelatin. The collagen is present in the form of fine films which ramify in all directions to form a continuous tough membrane; gelatin on the contrary is very tender. When meat is kept in cold storage there is a slow softening and swelling of the collagen.

ASSESSMENT OF TEMPERAMENT.

AN article by Mr. P. E. Vernon in the January number of the *Eugenics Review* is at once a reminder of the weak spot in existing resources for mental testing and a contribution to its strengthening. While general intelligence and specialised aptitudes can now be assessed in such a way as to make estimation of educational and vocational potentialities reasonably accurate "the affective factors of temperament and personality and of interest still seem to be beyond us," and it is these factors which determine whether the potentialities are likely to be realised in actual fact. Mr. Vernon attributes this lack of success in measuring personality to the indefiniteness of temperamental tracts, as compared with qualities of physique and intelligence. One trait may be exhibited by a person in one set of circumstances, and a totally opposite trait by the same person in other circumstances. Different traits may also be elicited in the presence of different observers—teachers, school friends, and relatives may differ greatly in their estimates of a child with regard to a particular trait, or may even describe in differing terms their impressions of a child based upon one and the same episode. All these facts show the unreliability of the rating methods of testing which depend on the judgments of individual observers. Mr. Vernon's own method does not completely evade these difficulties. Stated briefly, it is a method of "sampling" with three parts. To obtain a measure of a person's timidity, for example, a number of test situations are devised to which some would respond with timid, and others with courageous, behaviour, and the reaction of the subject is recorded. The second part is a questionaire about his past behaviour under conditions likely to elicit fear or the opposite. Three or four possible answers being suggested to each question, the subject being asked to supply the answer which best describes himself. The third part is an estimate on a scale by other people, based on actual objective behaviours of his timidity. The samplings have then to be judged and scored in relation to their distribution in a large group of individuals of nearly similar background and age, and when a group of samplings for different traits have been so made and scored for an individual, it is necessary to discover the extent to which the different results correlate. The method is obviously elaborate and liable to fallacy. The reliability, for example, of the subject's replies to the questionaire will depend upon his sincerity in stating his real reaction to the situations presented. The possibilities of bias cannot be excluded from the reports of other observers. Mr. Vernon, indeed, confesses that his paper is an

account rather of the difficulties than of the achievements of the method and from the brief description given it is not easy to appreciate what is likely to be its value. The fuller account which is promised for an early date will therefore be awaited with interest. Meanwhile, the article serves to emphasise rather than to minimise the difficulties of the problem, and one is left still with the impression that, while capacity may be comparatively well assessed by tests, the elusiveness of personality is such that it can only be tested by life.

HYPNOSIS AND ANÆSTHESIA.

IT is doubtful whether hypnosis will ever be relied on to play a large part in practical administration of anæsthesia. Indeed Dr. Bernard Hollander disclaimed any pretension of the sort when he read his paper before the anæsthetic section of the Royal Society of Medicine on Feb. 5th. Nevertheless he was able to show from numerous instances in his own experience and that of others that perfect surgical anæsthesia can be obtained purely through hypnosis. He expressed the opinion that in certain circumstances hypnosis should be employed either alone or as an aid to induction, and it appears that it might very well serve sometimes to replace preliminary drugs in procuring calm and banishing apprehension from some types of subject. The paper gave a comprehensive account of the history of hypnosis, but did not venture far into the disputed territory of its physiological and psychological explanations. Nor did subsequent speakers, who included, among others, Lady Berry, Dr. H. Yellowlees, and Dr. J. A. Hadfield, deal much with this side of the subject. A good many personal experiences were related, and one speaker advanced the opinion that, therapeutically, plain speaking on psycho-analytical lines could often effect better than hypnosis and suggestion what the physician was seeking to procure in his patient. Insomnia is certainly a condition for whose relief hypnosis has sometimes succeeded where all else has failed, and the same may be said with reservation of inebriety. For the relief of pain hypnotism can be of great service, and it was interesting to hear Dr. Hollander relate his early experiences in treating patients of the late Sir David Ferrier at King's College Hospital as long ago as the early 'nineties.

BACTERIOPHAGE IN INFANTILE DYSENTERY.

THE claims of d'Herelle for the therapeutic value of bacteriophage in bacillary dysentery have received very little support and have been the subject of numerous adverse communications. It has always been a possible objection to negative results that the bacteriophage administered may not have been of maximum potency, but with increasing experience of the properties of this agent the criticism has become of little force. A paper now presented by F. M. Burnet, Margot McKie, and I. J. Wood [1] details the results of this form of treatment in the bacillary dysentery of infants in Australia. This infection is almost wholly of the Flexner type and has been treated by these workers with highly active, polyvalent, anti-Flexner strains of bacteriophage, including d'Herelle's own *Bact-dysenterie-phage*. The results were disappointing, for in 25 treated cases the mortality was 44 per cent., whilst in 33 untreated controls it was 27 per cent. There are certain other facts of interest in these observations. It was noticed that the spontaneous appearance of bacteriophage was relatively rare among the younger infants observed: thus of 19 cases, below the age of 9 months, there were only seven in which the agent was present, whereas of 63 cases over this age, 43 developed a bacteriophage at some period in the course of their illness. This inequality in distribution may perhaps be correlated with the fact that in a detailed analysis of the treated cases the only ones which showed any suggestion of benefit from the specific treatment were the youngest infants. Here, however, the figures given are too small for any conclusions to be drawn. The authors accordingly reach the general conclusion that the Flexner bacteriophage has no influence on the course of infantile dysentery.

[1] Med. Jour. of Australia, 1931, ii., 714.

MENSTRUATION AND ATHLETICS.

THE effect of physical exercise on menstruation has been studied [1] at Kiel, where an athletic sports' meeting in 1930 provided an opportunity for an inquiry amongst the women competitors. A questionaire was prepared beforehand and during the 20 minutes' pauses between the different team events the athletes were introduced in groups and were examined according to the questionaire. In this way 243 competitors were interviewed. The entrants, who were drawn from a large variety of trades and professions, varied in age from 15–39, were divided into two groups: (*a*) those who had joined the athletic club before the onset of puberty; (*b*) those who had joined after puberty. In these two groups there was found to be no marked difference in the age of onset of puberty which was 14·6 years in group (*a*) and 14 years in group (*b*). In answer to inquiry about capacity for work during menstruation the following facts were elicited. Among 243 competitors 7·4 per cent. were better at work or games, 49 per cent. noticed no difference, 35 per cent. found they were less good, and 8 per cent. could not say, for they had never attended physical exercise during a period.

A table was compiled of the irregularities of menstruation remarked in the course of the questionaire and 44 competitors made additional statements. To give the figures and relate the statements in detail is here unnecessary, but they give an important indication of a direct effect of physical exercise on the course of menstruation; further, those cases where a beneficial effect was noted are of definite value as demonstrating clearly that in some cases good does result. The next question to be investigated was "Are disturbances of menstruation found more often or more seldom in athletes than in other women of similar age or profession?" As a control, the statements of girls attending the evening classes in their last year at the Women's Technical School at Kiel were taken; these girls formed a particularly favourable group as scholarships are hard to obtain, and only the healthiest candidates are selected. It was found that disturbances in rhythm of the menstrual period showed similar figures in both classes, but the course of the period showed greater disturbances among members of athletic clubs than among the students. The fact that the loss may be prolonged and increased by physical exercise and that pain may be enhanced if an athletic competition occurs during a period, stood out clearly, though it seemed fair to presume that psychical influences played a part also. From this investigation it appears that there is no necessity to stop all gymnastic

[1] Brunn, L.: Münch. Med. Woch., 1931, lxxviii., 1913.

exercises during a menstrual period, for sometimes disturbances of menstruation were found to disappear when physical exercises were continued during the period. On the other hand, there appeared to be a certain number of women whose constitution required that they should spare themselves during menstruation and these should not be induced to continue physical exercise at that time.

HEAT-STROKE.

HEAT-STROKE has received more notice lately, and a recent number of the *Tropical Diseases Bulletin* [1] summarises eight papers which have appeared during the past year. P. Cazamian,[2] it is stated, gives a careful study of heat-stroke as it is seen in steamships and takes the view that coagulation of myosin occurs in the affected muscles. He recommends injections of ether, caffeine, camphor, and glucose, and plenty of fluid to drink. Twenty mild cases among the troops in Allahabad have been described by C. F. P. Hamilton, D. N. Busu, and J. Van Haeften,[3] and F. Marsh has discussed the ætiology [4] and described experiments with rabbits, from which he concludes that the heat rays and not the ultra-violet rays are responsible for heat-stroke. Since these contributions were analysed in the bulletin Surgeon-Lieut. Hugh Willoughby and Flight-Lieut. Edward Aslett [5] have produced a review of the subject which repays attention.

The term "heat-stroke" they point out, does not represent a simple clinical entity but includes three morbid states—heat exhaustion, heat hyperpyrexia, and sun traumatism. Heat exhaustion is a syncope with symptoms of shock, directly due to interference with heat loss. The attack is generally sudden and short, characterised by giddiness, collapse, dilated pupils, cold skin, soft, small fluttering pulse, and subnormal temperature. The patient usually recovers when placed in a cool temperature and given stimulants. As his temperature is already subnormal he should not be douched, but his face may be sprayed with cold water, and in severe cases camphor in oil may be injected and hot-water bottles applied. These writers recommend brandy as an excellent standby. A man ought to be ready for duty again in 24 to 48 hours. Heat hyperpyrexia is due to exposure to high temperature, but occurs in certain districts only: in the valleys and deltas of rivers and on low-lying coasts, but never on the high seas. It is due to inability to lose heat by the normal routes. It may be predominantly nervous, gastric, or choleraic in its symptomatology. The temperature may be as high as 110° F., the face is flushed, the skin hot and dry, the breathing stertorous, and consciousness entirely lost. The pupils are contracted, and the urine, which is usually offensive, contains indican. Prompt and energetic treatment is essential; the temperature must be reduced to 104° F. by sprays, douches, and iced enemata, and then the patient should be wrapped in a dry blanket and left alone lest hypopyrexia follow. In a dry climate the temperature is best reduced by a fine spray, covering the body with small globules to dissipate heat by evaporation; in humid climates heavy douching with iced water and rubbing the body with ice, to dissipate heat by conduction, is better. Alcohol is contra-indicated until sweating is re-established, and strychnine must never be given. Artificial respiration may be necessary, and strophanthin and intravenous alkali are useful. An attack can be prevented by proper attention to premonitory symptoms: restlessness, vertigo, headache, confusion, anorexia, thirst, sighing, nausea, vomiting, and suppression of sweat. In Willoughby and Aslett's opinion, nobody who has had an attack of heat hyperpyrexia should continue to live in the tropics.

The third form of heat-stroke—sun traumatism—they ascribe to some unexplained action of the heat rays of the sun, but an attack often occurs on an overcast day. The symptoms are intense headache and intolerance to light and sound, rapid full pulse, vomiting, dry skin, and perhaps delirium. The treatment consists in absolute rest and quiet in a dark room, with ice packs for the head and bromides if necessary. The after-effects may be serious—loss of memory, mental confusion, and inability to concentrate—and here again the patient should cease to live in the tropics.

This useful review by Willoughby and Aslett includes a comparative table of the three conditions and some remarks on their differential diagnosis from other states, notably cerebral malaria, which should never be overlooked in tropical practice. They recommend the establishment of a "heat-stroke station" at sick quarters and suggest the form which this should take. The heat-stroke ward in the hospital of the Anglo-Persian Oil Co. at Masjid-i-Suleiman has been described by Frank Marsh [4] and also by D. C. Rennie.[6] Its cost amounts to between £400 and £500 per annum and no case has gone on to heat-stroke since the ward was opened.

[1] Trop. Dis. Bull., Nov. 1931.
[2] Arch. Méd. et Pharm. Nav., 1928, cxviii., 102.
[3] Jour. Roy. Army Med. Corps., 1930, lv., 120.
[4] Trans. Roy. Soc. Med. Hyg., 1930, xxiv., 257.
[5] Jour. Roy. Naval Med. Serv., Jan., 1932, p. 1.

ACUTE PULMONARY ŒDEMA.

ACUTE pulmonary œdema is one of the most dramatic symptoms in medicine, and several theories have been advanced to explain its origin. Cases in which it develops after the exhibition of various drugs such as organic arsenical preparations or quinine, after exposure to irritating gases, or as a manifestation of some chemical poison, form but a small though clear group compared with those in which it occurs in the course of heart disease, especially mitral stenosis or hypertensive heart failure, whether due to renal disease or hyperpiesia. A paper by R. C. Brock and E. A. Blair [7] dealing with experiments on respiratory movements, describes in detail the series of events in the production of the œdema and in a few particulars amplifies the work done on that subject by Y. Matzuoka in 1915. In the heart-lung preparation they found that occasionally for some obscure reason, when the artificial circulation was opened up, the heart failed to maintain an efficient circulation. As the cardiac condition improved, this failure was almost always followed by a rapidly progressive pulmonary œdema. This is what the clinician would expect from observations on human beings, and it gives clear indications and contra-indications for treatment. As M. C. Winternitz and R. A. Lambert pointed out in 1919, it is not the œdema that kills but the underlying serious state, and it is not surprising that atropine is useless. Brock and Blair also observed in their experiments that respiratory movements increased the œdema and consequently the use of artificial respiration as advised by H. Emerson in 1909 and based on animal experiments seems unjustifiable. But the definite indication gained

[6] Trans. Roy. Soc. Med. Hyg., 1930, xxiii., 645.
[7] Jour. Thoracic Surg., 1931, i., 57.

from Brock and Blair's studies is not to allow the recovering heart to pump too forcibly or too much. Early venesection seems definitely demanded to reduce the pressure in the lung, because, as Matzuoka pointed out, œdema could be produced whether the increased pressure was due to a forward or a back pressure, and venesection will lessen both. It seems probable that the condition giving rise to this serious symptom might more often be treated successfully if venesection was carried out promptly.

ARTHUR CHUDLEIGH.

Mr. Arthur Chudleigh, the well-known theatrical manager, who died on Friday, Feb. 5th, had more than one connexion with the medical profession, many members of which, in company with a large public, will regret his death. He was the son of a doctor and, under his real name of Lillies, was educated at Epsom College, the intention being that he should follow his father's career. But an early attraction to the stage dictated for him a very different life. Although as an actor he made no particular mark, he made what was more important, very many friends, through his engaging personal qualities, with the result that he was able when quite a young man and with no private means to take over the management of the Court Theatre. This he did in partnership with Mrs. John Wood, a really popular favourite, and to make an immediate practical success of the venture was the more creditable in that his predecessors in the management, Arthur Cecil and John Clayton, had taught the public to expect much. The high standard of amusement was maintained, and for years the Court Theatre resounded with the laughter due to the wit of the Pinero farces, and their representation by a company of brilliant actors and actresses. This managerial success Chudleigh repeated at the Comedy Theatre, remaining associated with stage production until some 15 years ago. About this time he joined the Council of Epsom College and became an assiduous and generous supporter of the recent developments taking place in the foundation. At the largely attended memorial service, held at St. Martin-in-the-Fields on Tuesday last, the Council of the College and the educational staff were represented.

THE MEDICAL INDUCTION OF LABOUR.

A PAPER by Mr. R. L. Dodds analysing 338 cases of medical induction of labour at the City of London Hospital[1] bears out many conclusions to which we referred in a recent annotation.[2] The cases were studied with a view to evaluation of the factors leading to successful induction and of the risks of repeated attempts as regards the effect both on the course of the subsequent labour and on the fœtus. The method of induction adopted was the administration of 1½ oz. of castor oil followed two hours later by an enema and a hot bath; quinine sulphate, grs. 20, was then given in two-hourly doses of grs. 10, 5, and 5, and, if labour had not begun in 11 hours, two injections of 0·5 c.cm. of pituitrin were given at intervals of an hour. The criterion of success was the onset of labour within 24 hours of the first dose of quinine. Success was obtained in 183 cases (54 per cent.). The usual experience that the degree of maturity is the most potent factor in success was confirmed, the percentages of successful cases being 40, 51, and 65 respectively in 101 cases induced prematurely, 88 induced at term, and 149 induced when the pregnancy had exceeded its usual duration. Albuminuric cases also showed a higher percentage of successes (62) compared with the non-albuminuric (52·7). The chances of success when a second or third course of treatment was tried were less than after the first course, and this lack of sensitiveness of the uterus appeared to show itself also in inertia in the first stage, which was of longer duration, and by a high proportion of instrumental deliveries in the second stage. Too many factors, however, come into consideration—in a group of cases containing a large percentage of inductions performed for disproportion—to allow of definite conclusions. The forceps rate is not as high as in the American figures quoted in our last annotation in which we questioned the advantage of repeated attempts at medical induction because of the very small number of cases in which natural delivery followed. The figures in Mr. Dodds's paper show another experience also noted by the American observer in that no greater success was obtained by the use of grs. 50 of quinine than with grs. 20. The stillbirth-rate was high (10·7 per cent.), and in five cases among 344 births quinine fell under suspicion; but here again so many other complicating factors were present that Mr. Dodds draws the conclusion that less than 2 per cent. of medically induced labours result in stillbirths "possibly due to quinine."

[1] Jour. Obstet. and Gyn. Brit. Emp., 1931, xxxviii., 827.
[2] THE LANCET, 1931, ii., 1311.

THE IRIS IN VERTEBRATES.

THE latest fruit of Miss Ida Mann's research into the comparative anatomy of the eye is an elaborate account of the iris in vertebrates.[1] It is enriched by 57 coloured illustrations, most of them pictures of the irides of animals in the Zoological Gardens, London, and in themselves very beautiful. These pictures had to be made from the living eye, and while reptiles and amphibians proved fairly amenable, the mammals were usually troublesome and the fish very difficult. The characters to which special attention was directed were arrangement of blood-vessels, shape of pupil, nature and distribution of pigment, and relation of pigment pattern to skin pattern where such existed. In mammals the main plan of the circulation never varies; there is a circumferential arterial circle giving radial branches superficially to the inner circle where they anastomose with veins. The human iris is typical. The shape of the pupil, however, is very variable in mammals, deviations from the circular shape being correlated with the mode of life of the animal. In nocturnal animals, including most carnivores, it is vertically oval. In diurnal, shade-loving animals such as herbivores it is oval horizontally. As to pigmentation, in mammals this is typically some shade of brown. All the varieties of colour in the human iris are due to varying amounts and distribution of this pigment, most of it deposited as a rule during the first six months after birth. In birds, the vascular arrangement, which is to be considered the most fundamental character, is different from that seen in mammals. There being no pupillary membrane the superficial layer of the iris is absent, and the vessels correspond to those in the deeper layer of the mammalian iris, which are not normally visible during life. The sphincter of the pupil is well developed and is composed of striped muscle, not contracting reflexly to light

[1] Iris Pattern in the Vertebrates. By Ida Mann, D.Sc., M.B., F.R.C.S. Reprinted from Trans. Zool. Soc. Lond. 1931. Part 4.

as in the mammal, but apparently under voluntary control. Most of the visible vessels are part of a large capillary plexus covering the sphincter on a background of pigment which is of very various colours in different species. Reptiles and amphibia exhibit their own peculiarities; metallic pigment is often present and there is a protective colour-striping of the whole head involving the lids, conjunctiva, and iris stroma. This is especially well seen in snakes. In frogs the shape of the pupil has different outlines according to the particular species, and in many species the shape alters with the illumination—for instance, from pear-shaped to heart-shaped, dilating to a complete circle in very dim light. In fish there is a remarkable brilliance of coloration and many fish, such as the salmon, have a notch on the inner side of the pupil, not a true coloboma, but displaying an aphakic area such as in human beings is seen in cases of dislocated lens.

There are many other peculiar varieties in the vertebrate iris which may be studied in this fascinating work. One is seen in the gecko, a specialised form of lizard. These animals are nocturnal hunters, but in the day sit basking on tree trunks in full sunlight. In dull light the pupil dilates widely to a complete circle. In bright sunlight it narrows to a long vertical line and appears to be completely closed. On careful examination, however, four small diamond-shaped openings in the slit can be discovered. These allow good vision in daylight without dazzle and with a wide vertical field of vision. With a normal lens the four rays of light would all be focused on the same point in the retina, so that single vision would result.

WEATHER CHANGES AND HEALTH.

WE hope that the new Section of Physical Medicine of the Royal Society of Medicine will be stimulated rather than depressed by the chilly agnosticism which the director of the Meteorological Office brought to its first meeting.[1] Dr. Simpson maintained that the only important influence which weather had on the body is its extraction of heat. In most rooms in this country, he said, enough air exchange is effected to obviate any ill-effects, and those of us who become depressed when the windows are closed must consider our symptoms "chiefly psychological." In a letter this week Fleet-Surgeon W. E. Home welcomes this point of view as preferable to the old and discouraging idea that tropical diseases were due to climate. At the same time he records interesting observations about the relation between air humidity and illness, and it seems a pity that curiosity on such points should be rare, except, apparently, among members of the Home family. Close investigation might reveal more justification for the layman's steady belief in a connexion between bodily and climatic changes. It has been noticed, for instance, that colds and chills more commonly follow a change towards warmer than towards cooler weather, and Dr. K. Stotle,[2] of Breslau, has lately tried—though not with much success—to explain this paradox in the medical language of our time. In the first place he records how children who have remained healthy throughout the winter contract tonsillitis or nasopharyngitis with the first warm days of spring although there is no reason to suppose they have been chilled. He further points out how common it is for town children sent to convalescent homes in the country to develop coughs and colds within a few days of arrival, although their surroundings are much improved. Again, he says, it is well known that tuberculous meningitis grows commoner in spring. The increase does not occur at any constant month, and has nothing to do with poor nourishment and bad surroundings during the winter, for it is seen in all classes. While usually appearing from the middle of February to the middle of April this increase of acute tuberculous affections in childhood was delayed in 1931 until May, owing to an exceptionally long winter. In other words, it is the first warm days of spring which appear to be the climatic factor rather than the lack of sun during the winter months. Seeking for some explanation of these observations Stotle points out that in children the maximum period of growth takes place during spring, and he thinks that in this increase in new cells lies the possibility of decreased resistance to disease. Further, he remarks that ultra-violet radiation produces definite alterations in the mineral content of the blood—as shown in its extreme form in rickets—and such biochemical changes, especially as they affect the water content of the tissues, may well be associated with alterations in resistance to infection.

[1] See THE LANCET, Jan. 30th, p. 242.
[2] Jahrb. f. Kinderheilk., 1931, cxxxiv., 6.

Mr. Wilfred Trotter, F.R.S., will deliver the Hunterian Oration before the Royal College of Surgeons of England at 4 P.M. on Monday, Feb. 15th. His subject is the Commemoration of Great Men.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. J. D. Murphy is placed on the retd. list.

The following appointments are notified: Surg. Lt.-Cmdrs. R. W. Mussen to *President* for Naval Medical School, Greenwich; and E. R. Sorley to *Malabar* for Bermuda Hospital.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub.-Lt. J. D. Spillane to be Surg. Sub-Lt.

Proby. Surg. Lt. (D). E. N. F. Jenkins to *Victory* for Haslar Hospital.

ROYAL ARMY MEDICAL CORPS.

Maj. W. J. F. Craig, from the secd. list, is restd. to the estabt.

Lt. (prov. Capt.) J. W. Kendall half-pay list, relinquishes the prov. rank of Capt.

D. P. F. Mulvany from a temp. commn. to be Lt.

TERRITORIAL ARMY.

Lts. H. A. Bulman, A. Roberts, and F. Lawence to be Capts.

ROYAL AIR FORCE.

Medical Branch.—The undermentioned are granted short service commissions as Flying Officers for three years on the active list: F. W. P. Dixon, C. R. Palfreyman, J. A. Kersley, D. C. MacGilchrist, C. A. Rumball, and A. M. Weston.

Flight Lt. A. S. Burns is granted a permanent commission in this rank.

Squadron Leader H. B. Troup is placed on the retd. list on account of ill-health.

INDIAN MEDICAL SERVICE.

Capt. (prov.) C. K. Lakshmanan is confirmed in his rank.

Lt. J. F. Shepherd to be Capt.

DEATHS IN THE SERVICES.

Lt.-Col. Samuel Forster Lougheed, C.M.G., R.A.M.C., retd., who died on Feb. 4th at the age of 72 was the son of the late S. Lougheed, of Ballinakill, Co. Sligo. Graduating M.D., R.M.I., in 1881, he entered the Army in the following year and served throughout the South African War from 1889 to 1902 (mentioned in despatches, Queen's Medal with three clasps and the King's Medal with two clasps). He received the C.M.G. in 1900.

His wife, who pre-deceased him in 1920, was the daughter of the late C. Hammerton, of Horsham.

SPECIAL ARTICLES

A STUDY OF THE B C G STRAIN OF TUBERCLE BACILLUS.

WITH AN ACCOUNT OF TWO IMMUNITY EXPERIMENTS AND A PRELIMINARY REPORT ON THE CULTIVATION OF TUBERCLE BACILLI ON BILE MEDIA.

BY A. STANLEY GRIFFITH, M.D. VICT., PH.D. CAMB.,

MEMBER OF THE SCIENTIFIC STAFF, MEDICAL RESEARCH COUNCIL.

(From the Field Laboratories, University of Cambridge.)

(Concluded from p. 308.)

The Two Immunity Experiments.

THE immunity experiments reported in THE LANCET by Buxton and Griffith [6] showed that a high degree of resistance against experimental tuberculosis can be conferred upon calves by vaccination with B C G. In that paper mention was made of two preliminary immunity experiments on calves, the details of which were not then given. Advantage is taken of this report to put them on record.

The experiments were undertaken by me in 1926 for the purpose of comparing the immunising value of B C G with that of an attenuated though still nosogenic strain of human tubercle bacilli obtained from lupus.

The calves which were kindly presented to me by Prof. J. B. Buxton were 3 to 4 months old and had not reacted to the double intradermal tuberculin test.

The following table gives the details of the vaccinations.

Date in 1926.	Method of vaccination.	Calf B. B C G.	Calf C. H 151 (lupus).
Jan. 28th ..	Subcut.	100 mg.	100 mg.
March 17th ..	Intrav.	5 ,,	5 ,,
May 5th ..	,,	10 ,,	10 ,,
June 21st ..	,,	50 ,,	50 ,,

Both calves reacted on May 5th to the intravenous injection of the third dose of vaccine, the temperature rising to 104·5° F. and 105·2° F. respectively.

Resistance test.—On August 26th, 1926, 66 days after the last dose of vaccine each calf was inoculated intravenously with 1·0 mg. of virulent bovine tubercle bacilli. At the same time two adult goats, one 18 months and one some years old, were inoculated intravenously with ·01 mg. of the same bovine culture to serve as controls, no calves being available. The goats died in 35 and 38 days of severe miliary tuberculosis of the lungs, the thoracic glands also showing extensive tuberculosis. Both calves reacted vigorously to the test inoculation and were ill for about a week; the temperatures rose to 106·8° F. and 107·3° F. respectively at the 21st hour and remained at a high level for three days, after which they fell to normal. The calves regained their health and grew into fine beasts.

The bullock (calf C) was used towards the end of 1927 for the purpose of producing a therapeutic serum and was given a series of injections of B C G. On Sept. 16th, 1927, he was injected subcutaneously with 200 mg. of B C G; there was no temperature reaction. On Oct. 3rd, 1927 he was given an intravenous inoculation of 10 mg. B C G; the temperature rose 3·1° F. at the 15th hour, and was high for three days. On Nov. 17th, 1927, an intravenous inoculation of 10 mg. of B C G again gave a good reaction. On Dec. 7th, 1927, a dose of 100 mg. of B C G was inoculated intravenously; the temperature rose on this occasion from 101·4° F. just before the injection to 105·8° F. at the 16th hour and 105·9° F. at the 19th hour, and was maintained at a high level during three days. On May 20th, 1928, five and a half months after the last dose of B C G, the double intradermal tuberculin test gave a negative reaction.

The bullock was killed on May 23rd, 1928, 1 year 270 days after the resistance test. The autopsy showed no sign of tuberculosis and guinea-pigs inoculated with emulsions of the thoracic, mesenteric and prescapular glands did not become tuberculous.

The heifer (Calf B) was sent to the bull on Sept. 16th, 1927; she was then in excellent health and condition. On June 27th, 1928, she gave birth to a healthy calf which was brought up on the mother's milk. Two months later the calf did not react to the double intradermal test or to an intravenous injection of 10 mg. of B C G and was used for an immunity experiment (see calf D, THE LANCET, 1931, i., 393).

Two months before full term some mammary secretion from each of the four quarters of the udder of the heifer was withdrawn and tested for the presence of tubercle bacilli No colonies of tubercle bacilli were obtained on culture tubes and a guinea-pig inoculated with the secretion remained healthy.

Before calving the heifer became weak in the hind limbs; the weakness, I thought, was traumatic and caused by the bullock who lived in the same paddock. After calving she became weaker, and on August 20th, 1928, i.e., two years after the test dose, she was slaughtered. At the autopsy no sign of tuberculosis was found anywhere.

There is, of course, nothing new in the production of immunity in cattle against tuberculosis by the inoculation of living tubercle bacilli. The experiments of numerous observers have shown that by the inoculation of living cultures of human, avian, or—in small doses—bovine tubercle bacilli, or of attenuated strains of any of these three types, the specific resistance of a bovine animal can be raised sufficiently to protect it against the inoculation of a dose of bovine bacilli which is capable of setting up severe and fatal tuberculosis in an animal not so protected.

The use of living tubercle bacilli which have some pathogenicity is, however, inadmissible, since it has been shown that the bacilli may be excreted in the milk, or may remain alive for long periods in the tissues or, in the case of attenuated strains, may regain their virulence,[8 9] and thus be the means of propagating tuberculosis from cattle to man.

B C G is an attenuated strain of the tubercle bacillus, but it is claimed by the originators that this strain is incapable of causing progressive tuberculosis in man or any species of animal or of regaining its original virulence during long stay in the human or the animal body. This claim is supported by the results of the researches of the majority of tuberculosis workers.

On the other hand, a few investigators are not in agreement with the view that B C G may be regarded as certainly free from all danger to man and animals. For example, Watson and his collaborators,[15] and Uhlenhuth and Seiffert [16] believe that B C G has sometimes produced progressive tuberculosis in guinea-pigs. Petroff, Branch and Steenken [3] claim to have dissociated a virulent element from an original culture. Dreyer and Vollum [17] believe that the culture may acquire virulence when grown in the depth of broth. Sasano and Medlar [18] report that they have obtained a virulent strain by growing B C G on the surface of broth. Komis [19] thinks he has succeeded in rendering B C G virulent by means of fermentation with wine yeast.

Attempts to Attenuate Tubercle Bacilli by Growing them on Bile Media.

In their first paper on the subject Calmette and Guérin [20] make the interesting statement that the bovine strain, eventually to be named B C G, after a single subculture on bile potato exhibited a little higher virulence for the guinea-pig than the same strain of bacilli which had been maintained on ordinary potato. Guinea-pigs inoculated intraperitoneally with 1·0 mg. of the bile bacilli always died within 18 days

while guinea-pigs inoculated with the same dose of the same strain on potato survived for periods of from 20 to 45 days.

Two tests were made by me with the Pasteur Institute strain of bovine bacilli, named "Bovine Vallée," on media with and without bile.

Experiment 1 (July, 1931).—Two guinea-pigs were inoculated intraperitoneally with 1·0 mg. of the strain grown for 35 days on a 5 per cent. glycerin bile egg tube. At the same time two guinea-pigs were similarly inoculated with a 35 day old culture of the strain on plain egg. The guinea-pigs inoculated with the bile culture died of subacute general tuberculosis in 36 and 42 days. The guinea-pigs inoculated with the plain egg culture died of acute tuberculosis in 12 and 19 days.

Experiment 2 (September, 1931).—As above with the exception that the cultures used were 28 days old. The guinea-pigs inoculated with the bile culture died of general tuberculosis in 23 and 24 days while those inoculated with the plain egg culture died in 19 and 26 days, one of acute, the other of subacute general tuberculosis.

These experiments showed that after single sub-cultures on glycerin bile egg the strain "Bovine Vallée" was not of higher virulence for guinea-pigs than the same strain grown on plain egg.

On the other hand, these authors [2 21] stated that when successive subcultures were made on bile media the bacilli instead of further increasing in virulence became attenuated at each passage. After 15 passages the bacilli in doses of 1·0 mg. intraperitoneally caused "une tuberculose viscérale compatible pendant plus de cinq mois avec les apparences d'une bonne santé sans amaigrissement." The same inoculation under the skin provoked a slow enlargement of the neighbouring gland; sometimes an abscess formed at the seat of inoculation which opened and then healed. The affection showed no tendency to generalisation. After 42 passages when the strain had been cultivated on bile media for a period of about four years the bacilli appeared to be stablised in virulence for the guinea-pig.

Calmette and Guérin further state that the bile culture of the forty-second passage, although incapable of causing general progressive tuberculosis in the guinea-pig, was extremely virulent for the horse. Two horses aged 3 and 14 years received 5·0 mg. *intravenously* and succumbed respectively 55 and 73 days later with "des lesions énormes de granulie pulmonaire."

For bovines there was the same march of decreasing virulence as was observed for the guinea-pig. At the second passage 5·0 mg. intravenously provoked a typho-bacillosis without follicular lesions. At the tenth passage a dose of 50·0 mg. was necessary and at the fifteenth 100·0 mg. caused a general disease "d'allure typhique" which was rarely fatal and never accompanied by the formation of lesions.

It was evident from the pathogenic history of the strain that already after only 15 subcultures on bile media, extending over a period of about one year, the strain was no longer capable of producing progressive tuberculosis in calves and guinea-pigs.

In order to ascertain whether other strains of the tubercle bacillus could be as readily modified in this way I began in 1925 the serial cultivation of two strains, one of bovine and one of avian tubercle bacilli, and at a later date added three further strains of bovine and one of human bacilli. These six strains have now been continuously subcultivated on bile media, the transfers being made every two to three weeks, for periods ranging from four to six years. The bile media used have been potato soaked in 5 per cent. glycerin ox-bile and 5 per cent. glycerin egg to which was added before inspissation 10 per cent. (in the early experiments, 7·5 per cent.) ox bile.

The cultures of mammalian tubercle bacilli on the bile egg medium are strikingly different from those on egg without bile. Instead of being dry, coherent, and difficult to emulsify, they are soft, moist, and easily emulsified. After two to three weeks' incubation the growth is shiny, moist, and translucent. On further incubation the growth thickens, becomes opaque, acquires a creamy or a buff colour, and closely resembles a layer of thick paint unevenly spread. In old cultures secondary colonies appear on the surface; in the case of four strains these were minute while in two they were large and varied in form, some being widespread and warty or wrinkled, some heaped up and nodular or umbilicated or crateriform.

On ox bile potato human and avian strains grow as freely as bovine strains and produce very similar growths. After from four to six weeks the growths are moderately thick, opaque, greyish, slightly or definitely creamy and warty on the surface. On magnification they are seen to be composed of small closely aggregated and super-imposed pearly grey colonies. The growth is moist and easily spread.

On transference to ordinary media the bile cultures of mammalian tubercle bacilli again produce dry coherent growths. The modification of cultural characters caused by cultivation on bile media is therefore not permanent.

The virulence of the bile strains has been tested at intervals. All the mammalian strains are still virulent and capable of producing progressive tuberculosis in the guinea-pig after from four to six years' cultivation on bile media; also the avian strain is virulent for the fowl. One strain only, No. 4 bovine virus, after 1308 days on bile media is definitely reduced in virulence, producing in guinea-pigs and rabbits a much more chronic form of tuberculosis than the same strain maintained on egg. This bile-cultivated strain recovered from the chronically infected guinea-pigs produces a severe form of tuberculosis in other guinea-pigs so that one cannot yet speak of a permanent attenuation of the strain. The passage experiments on bile media with the six strains are being continued.

Spontaneous Tuberculosis in Animals Inoculated with B C G.

Rabbits and guinea-pigs inoculated with B C G were, as a rule, kept apart from animals infected with virulent tubercle bacilli. For various reasons this rule was sometimes broken and a few animals were put into houses containing tuberculous animals. As a result one rabbit and two guinea-pigs contracted spontaneous tuberculosis.

1. The rabbit had been inoculated intravenously with 20 mg. of B C G and was killed 460 days after inoculation. The autopsy showed numerous caseous lesions in the lymphoid tissue of the appendix and a few in the solitary follicles of the cæcum. At the back of the left orbit there was a caseous abscess (of periosteal origin) and the left lachrymal gland was almost replaced by caseous nodules. The lungs were crepitant and showed a few minute grey foci. Typical avian cultures were obtained from the appendix, colon, lachrymal gland and orbital abscess. Two fowls inoculated subcutaneously with 15 mg. of one of the strains died in 49 and 52 days of general miliary tuberculosis.

The avian infection in this rabbit was, I think, acquired from two rabbits living in the house at the same time which had been inoculated with a strain of avian tubercle bacilli from a kangaroo.

2. A guinea-pig, one of two which had been inoculated with deep-broth cultures of B C G. Six flasks of broth were inoculated, each with the young growth from one glycerin egg tube, and were incubated for three or more months. There was no apparent multiplication of the bacilli except perhaps in one flask. The granules of culture were collected, emulsified and inoculated subcutaneously into two guinea-pigs which were killed 111 days later. One was found to be perfectly normal. The other showed nothing at the seat of

inoculation or in the adjacent glands; the anterior lobes of the lungs, however, each contained a caseous mass, that in the right being the more advanced; the bronchial glands, particularly the right, were much enlarged and caseating; the spleen contained caseating nodules and the liver grey tubercles. A highly dysgonic culture was obtained from the bronchial glands.

These two guinea-pigs had been put, through a misinterpretation of instructions, in a house containing guinea-pigs infected with mammalian tubercle bacilli.

3. A guinea-pig, one of another pair which had been inoculated with deep broth cultures of B C G. The cultures were seven months old (little if any multiplication had occurred) and the growth from one flask was injected intraperitoneally into each guinea-pig.

One guinea-pig was killed 82 days later and showed a pea-sized abscess in the omentum from which B C G was not recovered in culture. The other died of pleural effusion in 79 days. The omentum and the mesenteries were thickened and contracted and adherent to surrounding structures, the omentum containing an abscess; there were numerous small yellowish-white caseous masses on the visceral peritoneum, many loosely attached by fine fibrous strands; there was deposit of a similar nature between the liver and the diaphragm. The sternal and manubrial glands were a little enlarged and opaque. There were no tuberculous lesions in the spleen, liver or lungs. The mid-cervical gland on the right side was enlarged and composed throughout of firm creamy caseous substance; no other gland was affected in this way. Microscopically the caseous substance from the abdomen showed numerous beaded tubercle bacilli. Numerous egg and glycerin egg tubes sown from abdominal pus, the sternal and manubrial glands remained sterile. An emulsion of sternal gland did not produce tuberculosis in a guinea-pig.

A culture of tubercle bacilli was obtained from the cervical gland. The culture was dysgonic, though not highly so. Two guinea-pigs were inoculated subcutaneously, each with 1·0 mg. of the culture. One killed 104 days later showed general tuberculosis of a mild type. The other died in 150 days of severe chronic general tuberculosis. These guinea-pigs lived longer than is usual for guinea-pigs inoculated with 1·0 mg. of fully virulent bovine bacilli. A rabbit inoculated intravenously with 0·01 mg. of the culture died in 33 days of severe general miliary tuberculosis.

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MEDICINE AND THE LAW.

Hospital Benefits by Subscription.

THE Assurance Companies Act of 1909, in this respect superseding an older enactment of 1870, requires that persons or bodies carrying on life insurance in the United Kingdom must deposit in court a sum of £20,000, to be invested in approved securities. The obvious purpose of this requirement is to make sure that such undertakings are solid, solvent, and permanent, so that anyone who thriftily pays his premiums year after year shall not find his security suddenly vanish when he most needs it. The question has lately arisen whether the British Provident Association for Hospital and Additional Services is within the statute, and is therefore obliged to make the £20,000 deposit. The Association was formed in 1923 to recoup to its subscribers their expenses in hospitals and nursing homes or in respect of surgical operations. It has no share capital; it is a company "not for profit." Its articles of association allow no dividend or bonus to be paid to members; in the event of its dissolution, surplus funds are to go to charitable purposes. Its prospectus invited subscriptions and described the financial help which subscribers would receive towards the expenses already described and the limits of amount and duration. Every subscriber received a card explaining the amounts due from him; it warned him that the amount of benefit depended on the amount subscribed and on the calls for contributions made on the Association. Subscribers were given no policy of insurance; indeed the memorandum of association expressly provided that the Association was not to conduct insurance business.

A friendly test action was brought before Mr. Justice Farwell, who has held that the Association is carrying on a charitable business, is not issuing insurance policies, and is outside the statutory requirement as to depositing £20,000. He did not regard the combined effect of prospectus and subscription as a policy; it was merely a contract to pay benefits according to the undertakings in the prospectus. The operations of the Association therefore are neither illegal owing to the omission to deposit £20,000, nor ultra vires owing to breach of the provision in the memorandum which stipulates that the Association shall not conduct insurance business.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

AMALGAMATION OF HOSPITALS IN DUBLIN.

THE Charter Day dinner of the Royal College of Surgeons in Ireland was held in the College Hall last Saturday, with Mr. Richard Atkinson Stoney, the President, presiding. There was a large number of guests, the principal being Mr. James McNeill, Governor General of the Irish Free State. The President in his speech dealt with the question of amalgamation of the Dublin hospitals in a rather critical spirit. As Mr. Stoney has hitherto been a supporter of the project of amalgamation his present views are likely to attract attention. It is true that he warned his hearers against the assumption that he was necessarily opposed to amalgamation in any form, but there was danger that in grasping at a shadow the Dublin hospitals might lose many real advantages which were inherent in their present system. Moreover, the expense of building and equipping an amalgamated hospital of sufficient size to be worth while would require—at a rate of £1000 a bed—from half a million to a million pounds, and the scrapping of the present hospitals would be a very wasteful procedure. He went on to direct attention to certain advantages of the present system, which he thought would be lost if the hospitals were amalgamated into one or two large hospitals. First he placed the custom existent in Dublin of receiving medical students as "resident students" in the hospitals, thereby accustoming them, before qualification, to dealing with patients with a certain degree of responsibility. He regarded the rivalry between a number of small teaching hospitals as healthy in that it stimulated the teachers to make sure that their teaching was of the best if they were to attract students and keep up a good class. Again, by the system of small hospitals the clinical classes were kept comparatively small so that the student could receive individual attention and teaching. From the point of view of the patients, it was of advantage to have the hospitals scattered widely over the city so that they were easy of access.

Mr. Stoney, however, gave no reason for his view

that the principal educational advantages which he attributed to the present system could not be as easily maintained under a system of amalgamation. It is clear, on the other hand, that with a larger body of students to deal with in a particular institution they could be better organised with study groups according to their standing and experience. The absurdity of attempting to teach students in their first hospital year and those preparing for their final examination in the same class would, for example, be avoided. Again, it will occur to many that the slight advantage accruing to the patients from ease of access to a hospital—not a matter of much importance in a compact city like Dublin possessed of a good transport service—is much more than counterbalanced by grave disadvantages. With hospitals of small size diagnosis and treatment are delayed by the impossibility of having at hand an adequate auxiliary staff. The hospitals are adequately—if not excessively—staffed by physicians and surgeons, each of whom, however, by lack of access to a wide field of experience, is debarred from gaining a special knowledge or skill in any special department of medicine or surgery. But the services of a pathologist, of a radiologist, of a biochemist, of an ophthalmic surgeon, of a laryngologist, have to be divided according to the days of the week between two, three, or more hospitals. Not only delay, but relative inefficiency is inevitable, for the physician or surgeon finds it difficult if not impossible to have personal interviews with the specialists to whom he looks for help.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

NATIONAL HEALTH.

REPORTS for the fiscal year 1931 are now coming to hand. Two of these [1] give evidence both of the state of national health and of the efforts being made to improve it. The public health service can boast of a good calendar year 1930 with record low death-rates for tuberculosis (68·5) and diphtheria (4·9) and in most respects a good beginning to 1931. A slight increase of pellagra in the first six months of 1931 (16,385 cases as compared with 13,359 in the corresponding period of the previous year) may possibly be related to the economic depression. "Many requests have reached the Public Health Service for authoritative information as to the effect of the present economic situation upon the public health." The surgeon-general regrets that more complete and comprehensive information could not be supplied, and adds significantly: "It will be recalled that recommendations have been made for several years past that a small appropriation be made for the purpose of developing and stimulating better reporting of the notifiable diseases."

Almost 20,000 passengers and 1597 seamen were certified at domestic ports to be suffering from contagious disease, mental defect, or insanity. Those who have condemned the stringency of the Immigration Act of 1917 will find some excuse for it in the detailed figures here presented. No less than 340 cases of trachoma and 596 cases of venereal disease were discovered among the passengers examined. At European ports of embarkation 41,737 passengers were vaccinated and 38,639 were deloused.

[1] Annual Report of the Surgeon-General of the Public Health Service, 1931. Pp. 354. 85 cents. Nineteenth Annual Report of Chief of Children's Bureau to the Secretary of Labour. 1931. Washington: Govt. Printing Office. Pp. 68. 10 cents.

The report of the division of scientific research discloses an astonishing amount of important work now in progress. With specially designed physical apparatus studies are about to be made on the biological action of the whole spectrum of radiation from the highest frequency X rays to electromagnetic radiation. It is hoped of course that some results of practical value in the treatment of cancer may be obtained. Our knowledge in this field is certain to make an important advance. A large programme of biological research in cancer must be added to the above physico-biological programme. It includes studies of resistance and immunity, of the biochemistry of malignant cells, and of susceptibility to malignant growths. All research workers in cancer will wish to inform themselves in detail from this interesting report of the plans and progress of the "office of field investigations of cancer" housed at the Harvard Medical School. The results of some other investigations of the public health service, as for instance, the studies on Rocky Mountain spotted fever, have already been described in my letters.

The report of the chief of the Children's Bureau is also charged with accounts of scientific investigation. A study of 7537 maternal deaths in 15 States shows plainly the correlation between deaths from "albuminuria and convulsions" and lack of prenatal care. It also shows that the value of prenatal care is little appreciated. Less than 1 per cent. of 4570 women who died in childbirth or in the last three months of pregnancy had received "really adequate" prenatal care. A study of neonatal deaths lays much emphasis on the importance of prematurity as a cause, but does not consider (at least in this report) the possibility that an hereditary or early developmental defect may be the cause both of prematurity and of neonatal death. Studies on the influence of the economic depression show that family relief expenditures in American cities increased 89 per cent. in 1930 over those of the previous year. In certain localities depending upon coal mining and small industries it is found that "local public and private resources . . . are quite inadequate . . . to meet the needs of the children of the unemployed or under-employed men." The report contains a very complete account of State legislation (both successful and attempted laws) which deal with children, including child labour, minimum age of marriage, and juvenile courts.

COMPULSORY HEALTH INSURANCE AT A UNIVERSITY.

The principle of health insurance is implicit in a scheme for health service to staff and employees of the clinics group at the University of Chicago, approved by the board of trustees. One dollar a month is to be deducted from the salaries of all employees for their expense of this service. Operations for the removal of defects discovered at the time of employment are not included in the service. But defects found at this time if they are liable to interfere with proper performance of duties, must be remedied within three months at the employee's own expense or on their own responsibility. After one year's employment under the scheme defects will be remedied free of charge. Two months' hospital care and treatment for conditions usually treated in the University of Chicago clinics is included in the benefits. All employees appointed or reappointed after Dec. 1st, 1931, are obliged to participate in the scheme.

WINDFALL IN PHILADELPHIA.

The Pennsylvania Hospital has received a windfall which should be welcome at this time. In 1879 they

claimed $175,000 from the estate of one Alexander J. Derbyshire. They lost their suit in the Supreme Court. In 1913 they made another unsuccessful attempt. Now at last they succeed through a new legislative enactment. The property has been increasing in value during the last 50 years and the hospital is richer by more than three million dollars.

THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.

(*Concluded from p. 260.*)

THE CASE FOR THE DEFENCE.

COUNSEL for Dr. Altstädt said that his client had gone to Berlin where (he stated) in the Robert Koch Institute B C G was cultivated in a room easily accessible from other rooms of the laboratory; and yet his client was held responsible for the same condition in Lübeck. The death of the first victim—infant G—was not a sufficient reason to stop the further application of the Calmette method as suggested by the public prosecutor. Not his client alone, but other physicians too had believed that that death had nothing to do with the B C G, but was due to congenital tuberculosis. His client had certainly believed B C G to be a virus fixe, but other physicians not concerned in the disaster shared that opinion. Whether that opinion was right or wrong the trial had not decided, but it was the holding of that opinion which had led Dr. Altstädt to introduce the Calmette method in Lübeck. He should not be punished for manslaughter by negligence on account of a possible error on a scientific question. He therefore pleaded for a verdict of not guilty.

Counsel for Prof. Deycke described his client as a man who had devoted his whole life to the welfare of humanity. As a young assistant at the Hamburg General Hospital he had discovered, by bacteriological research, the first cases of cholera at the beginning of the great epidemic of 1893 in that city, and his discovery had contributed to early preventive measures. He had been of opinion that B C G was innocuous and could by no means become altered, a point of view shared, not only by Prof. Calmette, but by medical science in general. Prof. Deycke now regretted that he had not considered Dr. Petroff's contrary opinion, the reason being that these experiments were not believed to be reliable. He was still convinced that contamination of cultures in his laboratory was impossible, and not in point of fact ascertained by the evidence submitted. Prof. Lange, who assumed contamination had come to that view by holding the theory of B C G being invariable—a theory which was beginning however to fade. The court, he said, ought to consider whether the belief that B C G was a virus fixe could be regarded as negligence under the law, all the more as medical experts differed over it. The great number of experts was a special feature of the trial and there was no single question on which they all agreed. He was of opinion that the non-existence of a special laboratory for which his client was especially blamed had nothing to do with the disaster. Finally, in his client's name, he protested against the attack on Prof. Calmette made by counsel for the parents. He asked for a verdict of not guilty.

Prof. Deycke was then allowed some final words. He had nothing, he said, to add to his counsel's remarks; it had been his ill fate to kill and injure many children in the desire to protect them against sickness. If the court came to the conclusion that the disaster had not been caused by force majeure, but by his negligence he was willing to suffer punishment. He begged the court to pronounce a verdict of not guilty for his associates.

THE SENTENCE.

The trial which began on Oct. 13th came to an end on Feb. 6th when sentence as pronounced. Prof. Deycke and Dr. Altstädt were both found guilty of manslaughter by negligence in 68 cases and of injury by negligence in 131 cases; they were sentenced to two years and one and a half years imprisonment respectively. Prof. Klotz and Nurse Schütze were found not guilty and acquitted, the charges against them not being sufficiently proved. In pronouncing the judgment of the court the presiding judge said the court had been convinced that although according to the opinions of some experts B C G vaccine may, under certain conditions, become virulent, the disaster had actually been caused by an exchange of B C G with other virulent bacilli or by contamination. The negligence was found in the fact that Prof. Deycke had prepared the culture in a laboratory where such contamination or exchange was within the reach of possibility. Dr. Altstädt, as director of the Lübeck Health Department, had acted negligently in not having the cultures tested before distribution to patients, and in not immediately stopping that distribution as soon as he had been informed by Prof. Deycke that something was wrong with them.

The sentence was heard by the numerous audience with strong emotion, Prof. Deycke being very popular in Lübeck as a conscientious physician and a member of one of the oldest families in the Hanseatic city.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 30TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 49 (last week 55); scarlet fever, 1586; diphtheria, 1039; enteric fever, 36; pneumonia, 1557; puerperal fever, 22; puerperal pyrexia, 114; cerebro-spinal fever, 36; acute poliomyelitis, 8; acute polioencephalitis, 1; encephalitis lethargica, 20; dysentery, 21; ophthalmia neonatorum, 79. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 2nd–3rd was as follows: Small-pox, 110 under treatment, 3 under observation (last week 124 and 6 respectively); scarlet fever, 1182; diphtheria, 1479; enteric fever, 10; measles, 780; whooping-cough, 331; puerperal fever, 16 (plus 10 babies); encephalitis lethargica, 222; poliomyelitis, 4; "other diseases," 275. At St. Margaret's Hospital there were 20 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox or enteric fever, 39 (14) from measles, 6 (2) from scarlet fever, 39 (5) from whooping-cough, 32 (6) from diphtheria, 25 (3) from diarrhœa and enteritis under two years, and 313 (86) from influenza. The figures in parentheses are those for London itself.

The deaths from influenza show a marked drop from the previous week. The total for the year so far amounts to 1458, against 795 for the corresponding period of 1931. Of the great towns Birmingham stands this week much higher with 21 deaths from influenza, Bradford reports 9, Croydon, Liverpool, and Manchester each 7. Manchester reported 6 deaths from measles, Liverpool reported 9 deaths from whooping-cough, Birmingham 7. Diphtheria accounted for 3 deaths each at Blackpool and Salford.

The number of stillbirths notified during the week was 263 (corresponding to a rate of 42 per 1000 births), including 40 in London.

PANEL AND CONTRACT PRACTICE

A State of Mind.

WHILE so much is being written in letters to our journals, in official memoranda, and in leading articles, about the sins of commission and omission on the part of approved societies or practitioners, the point of view of the insured person has nowhere been stressed. In his recent valuation report the Government Actuary impressed on the authorities responsible the importance of stricter supervision over certificates and claims for sickness benefit. He implies that we must get back to a standard level, and he indicates that the experience of ten years ago is a fair standard to work to. The question is, Can it be done? Such a view regards the present economic stress as a temporary phase, and assumes that we shall return to an era of prosperity such as the fat years 1921–23. But who is to say how much of the change in our economic life is permanent; has there not been concurrent change in mind and outlook of the people? It is not merely the doctors and the approved societies who are concerned in the question of increased claims for either sickness or unemployment benefits. People are claiming more frequently than they used to do, and not only of necessity. Ideas have changed. Claims are made as a right. The community or State is looked to for help when distress is caused by changes in economic conditions. So with health. People are exhorted to be healthy and provided with the means to do so in public health services. Why, it is argued, does not the State go further and provide something for economic loss. In this state of mind they do not regard their claims either on sickness or unemployment funds to be improperly made. The pressure of insured persons has greatly increased, and this point is stressed in the answer made by the Insurance Acts Committee to the Government memorandum, when reasons were given for asserting that the most important cause of the increase in sickness claims is the larger proportion of those who rightly claim to-day in comparison with those who claimed, say, ten years ago. The main factors in this change of mind are briefly:—

Propaganda by insurance committees and others, showing the wisdom of exercising rights.

Knowledge of rights, including the effect which the elimination of the first three days of incapacity has on future claims during the year.

Diminution of prejudice against exercising these rights.

Economic necessity for claiming rights.

Increased advice, and in some cases pressure from approved societies' agents, works officers, welfare workers, and others to claim benefits.

Increase in the scale of sickness benefit in some societies, increasing the inducement to claim benefits.

Finally, there is the higher standard of what constitutes health on the part of the whole community, which applies especially to pregnancy and the post-partum period.

Morbidity Statistics in Scotland.

As the result of a new scheme for morbidity statistics full particulars of every certificate issued in Scotland are now being recorded by the Scottish Department of Health, with the result of making it possible to undertake a systematic analysis of the sickness experience of the community. During the 12 months ended June 30th, 1931, notifications received from approved societies show that 392,335 first certificates were issued in respect of a total insured population on doctors' lists amounting to 1,779,191, that is, one first certificate for about every four insured persons. In particular panels first certificates are almost as high as one in every two insured persons. The average duration of the certified illnesses completed during this period was 25·95 days; this does not include cases of chronic illness whose duration extends beyond the period named. In the aggregate not less than 19,000,000 days of incapacity for work—representing an expenditure on benefits of about £2,000,000—have been certified by Scottish insurance practitioners for the patients under their care during the year in question. The causes of incapacity most frequently recorded are minor diseases of the upper respiratory tract, accidents, and influenza (each of which accounts for more than 10 per cent. of total incapacities), inflammatory and suppurative conditions of the skin and subcutaneous tissues, gastritis, and bronchitis (each of which accounts for more than 5 per cent. incapacities). Of the total days lost, the greatest proportion are due to accidents, bronchitis, rheumatism (undefined), inflammatory and suppurative conditions of the skin and subcutaneous tissues, gastritis, influenza, and minor diseases of the upper respiratory tract—in that order of importance.

In the incidence of incapacity, single women are equal to men; but married women are certified as incapable of work twice as frequently as men or single women. The average duration of illness, irrespective of cause, in married women is, moreover, 36 per cent. higher than that for men. The average for single women is also in excess of that for men by 21 per cent. In married women, 20 per cent. of the whole sickness loss is attributed to pregnancy and its associated conditions or complications. And there is another very striking fact: in both men and women incapacity for work is relatively most frequent at ages under 20 years, and the difference between men and women in respect of sickness incidence is relatively greatest at the earlier ages. It is obvious that the strain of work falls heaviest on the younger lives.

Rural areas show a lower incidence of incapacity but a higher average duration than urban areas. Of this longer duration part at least can be assigned to the lower proportion of short-duration illnesses in rural areas. In one area with a high certification experience during the first six months of the operation of the scheme, it was ascertained that many of the certificates issued were due to one particular cause-group of incapacity which, on further examination, was related to the method of work of the operatives in the particular occupation in that area. A simple protective device would, it is thought, effect a substantial saving of working capacity.

A CIRCULAR LETTER TO SCOTTISH PRACTITIONERS.

The Scottish Department has issued a circular letter to insurance practitioners asking for their coöperation in exploring methods for the reduction of this unprecedented sickness. Many new facts have already been brought to light by the inquiry—e.g., the frequency of incapacity for work at the earlier ages. Here is a problem for detailed research. It is recognised that the frequency in the issue and duration of claims must vary from factors outside the control of practitioners, and a few areas where this variation is greatest are to be specially investigated. The letter must be regarded as an administrative document of the first importance, marking indeed the beginning

of a systematic effort in Scotland to search out the flaws in the Insurance Acts. Some insurance practitioners have protested against the implied criticism and their protest may have considerable force. But when the incidence of certified sickness assumes the proportion of one in two of the lives at risk, certain questions suggest themselves: first, is this a genuine excess or is it due to too facile certification? Secondly, is the insurance system made to carry too heavy a load? There is a third question: How can the insured person secure the value of the public hospitals and clinics, official and voluntary, without being taxed twice? These are fundamental questions, and it will be interesting to watch how the Scottish Department will develop its methods of solving them. When the figures already collected are set forth in a full public document we shall possess genuine data for an estimate of the whole system.

A Conference on Certification in Rutland.

Medical practitioners in Rutland met representatives of approved societies at a conference held recently at Stamford, and reported in the *National Insurance Gazette* for Jan. 30th. It was decided not to discuss memorandum 329 I.G. as a whole, but to consider a few contentious points in administrative procedure. The chairman of the conference has summarised the discussion under headings, of which we quote the following:—

RELATIVE INCAPACITY.—The case of an insured person normally engaged in heavy work—e.g., an ironstone quarryman, who is incapable of that work and in receipt of benefit, but who has entered a stage of convalescence.

Answer: It appeared that societies would welcome information from practitioners when an insured person has so far recovered as to be able to do light work, although unfit for his usual occupation, and that practitioners could convey this information to societies in these cases by using the remarks space on medical certificates.

ANY WORK TO GO TO?—Should a doctor have any regard to the point as to whether a patient has any work to go to on recovery from illness?

Answer: It was considered that the practitioner should have no regard as to whether a patient has work to go to on recovery from illness.

SUSPECTED MALINGERING.—In cases of doubtful incapacity for work or suspected malingering, would medical practitioners prefer to reply to an inquiry from the society before the society refers the case to the regional medical officer?

Answer: It appeared that the medical practitioners would be willing to reply to such an inquiry, although it was remarked that this would entail further clerical work on the practitioner, which was undesirable.

REFERENCE TO R.M.O.—Having regard to the fact that practitioners can refer cases to the regional medical officer without payment of a reference fee, whilst a society has to pay 1*s.* 6*d.* in every case, could practitioners be induced to make greater use of the regional medical officer?

Answer: Several members of the medical profession stated that they were unaware that societies were subject to the charge mentioned in respect of references made by them. References by practitioners necessitated completion of a somewhat lengthy form and again increased clerical work. Some practitioners inserted the words "Refer to R.M.O." on certificates, but some societies took no action on this remark. It was felt that further precautions should also be taken by all concerned to ensure that the patient did not become aware as to whether he was referred by the society or the practitioner.

THE SICK VISITOR.—Medical certificates are to be regarded by societies as part evidence of incapacity only, and the society is under an obligation to satisfy itself that incapacity does exist—i.e., calls by sick visitor.

Answer: It appeared that this point was raised in order to acquaint medical practitioners of this obligation placed on societies as it was considered that, in the absence of knowledge on this point, there was a danger of offence being taken by practitioners against a duty which societies are called upon to perform.

Range of Service and Emergency Treatment.

Addresses are being given this winter in London to students and recently qualified men on insurance practice by lecturers thoroughly conversant with all the ramifications of the regulations. Dr. E. A. Gregg addressed U.C.H. men, and Dr. A. F. Heald St. George's men in December, and last month Dr. R. G. Chase gave a lecture at St. Bartholomew's Hospital which was reported in the Supplement of the *British Medical Journal* for Jan. 23rd. Dealing with the range of service in insurance practice this included, he said, all proper and necessary medical services other than those requiring special skill or experience of a degree or kind which general practitioners could not, as a class—that last phrase was important—reasonably be expected to possess. Those to whom he was speaking, he remarked, were about to go out into general practice with a knowledge of the latest methods of diagnosis and treatment, but the position of the older qualified men had to be remembered, men who had been in practice for many years, and who, perhaps, were not familiar with the latest methods. The range of service implied, not that which a particular man was capable of undertaking, but the kind of service of which general practitioners as a class were capable. A necessary qualification to this, however, was emergency treatment. In an emergency the practitioner might be called on for quite exceptional services. For example, in a case of laryngeal obstruction, it was the practitioner's duty, assuming, of course, that there was no possibility of getting the patient into skilled hands in time to save his life, to do a tracheotomy, whether he had special skill or not. Dr. Chase recalled the case of a doctor—a capable surgeon—who reported on the usual form that he had operated on a case of appendicitis which was of an urgent character. But he was not allowed to charge for the operation, because, although it was one beyond the skill commonly possessed by the general practitioner, he had reported it as an emergency.

Insurance Practitioner as Social Reformer.

Dr. G. de Swietochowski regards[1] the insurance medical service as the chief agency of social reform in the near future. Doctors, he says, have the best qualifications that men can have to make successful leaders amongst social reformers. They are intimately associated with large numbers of people, the character of the relationship being naturally a friendly one and at the same time a confidential one; they have the education and standing; above all they have the confidence of millions of people whose needs they know well, and they have the power to say and do things like no other men in the country. More use, he thinks, should be made of the link which has been established between the doctors and the government through the national health insurance system in order to introduce new methods and break with the old ones. The support of the government should enable insurance practitioners to exercise a gentle

[1] Presidential address to the Paddington Medical Society reprinted from the Medical World of Dec. 11th, 1931.

pressure on their patients without the fear of losing them. He adds :—

"In this way we may some day be able to tackle the everlasting craving for medicines, pills, and lotions. We could perhaps even face the question of drink without the fear of a revolution. If the whole medical profession lays down its views frankly, resolves unanimously to adhere to its principles and is backed by the supreme executive of the country, no great difficulties can arise. Whereas if undertaken by single individuals all such efforts are nipped in the bud. Even the hospitals in order to remain popular have still to keep up unnecessarily large supplies of practically useless stuff."

Looking back, he says, we must admit that things have improved a great deal, especially through schools and communal legislation; the partial prohibition of smoking and spitting in public places, followed by the anti-litter campaign as well as the very modern anti-dog-and-pavement measures are all to the good. But why should *personal* dirt still enjoy the privilege of going about unpunished? Surely, sooner or later this will be dealt with by a definite and separate legislation. The conditions in factories and workrooms, though vastly improved, still offer room for further amelioration. But the conditions of people's homes, their habits and customs and superstitious beliefs form a rock against which many good intentions are shattered to atoms. Here, he suggests, coöperation of government and a well-organised medical profession might introduce reforms of greater national importance even than those expected from and only partly realised by the National Health Insurance Acts.

CORRESPONDENCE

THE MECHANISM OF TUMOUR FORMATION

To the Editor of THE LANCET.

SIR,—May I express my admiration of Mr. J. J. M. Shaw's paper on the Ætiology of Cancer in recent numbers of THE LANCET? It increases knowledge and is very opportune. Mr. Shaw argues truly, as I believe, that one "cause" alone will not account for tumour formation. Nor is there a logical or biological necessity that it should. The most superficial analysis of causation—as it concerns the living body—distinguishes two factors or groups of factors: the factor of realisation or the *stimulus*; and the factor of determination or the *reaction* of the organism. The stimulus is extrinsic to the reacting part, regardless of its nature and origin. Its action is limited to inducing the reaction. The very nature and characters of the reaction are determined by the "constitution" of the organism, which means, in the end, its physico-chemical composition. Growth and development and, in short, all vital phenomena, are innate reactions to extrinsic stimuli. This is their mechanism, or "cause," in the eyes of biology.

Tumour formation is a manifestation of life when all is said and done. Like all vital phenomena it is an *innate* reaction to an extrinsic stimulus. I submit that knowledge of the latter is sound and adequate, though not complete. It is, as duly emphasised by Mr. Shaw, not one single stimulus, but one of many stimuli: from living parasites through introduced chemical substances and physical agents to products of metabolism of the body itself. Every one of these is followed by tumour formation. Their action as factors of realisation is demonstrated. What more can pathology do or be asked to do than to progress on these lines?

Much less is known of the innate reactions, the fons et origo of tumour formation. Now tumour formation is suggestively like physiological growth and development. It is (1) reaction to extrinsic stimuli, (2) proliferation and differentiation of cells capable of these functions, (3) consequent acquisition of new characters, (4) maintenance, and (5) transmission to future cell generations of the characters thus acquired. All these are subject to control and modification by the organism—even in tumour formation much more widely than generally admitted. I would draw particular attention to Nos. 4 and 5. They represent the so-called autonomy of tumours. In its persistence long after the factor of realisation can often be shown to have ceased to act, and in its essentially "intrinsic" manner of growth by proliferation of its own cells alone, an established tumour differs radically from a reaction to an infection, but agrees with every somatic organ. I find it impossible—I use the word advisedly—to regard tumour formation otherwise than as a *developmental* sequence; delayed and pathological development, if you please, but development nevertheless.

There is no necessity for the assumption of a superadded *new* reaction in tumour formation, in the sense that it is without parallel in physiological development, as Mr. Shaw is careful to indicate. Tumour formation is "new growth" or "neoplasia" simply in the sense that the liver or kidneys arise anew in the embryo. The same essential mechanism produces them all. Instead of morbid and unnatural, tumour formation is biological and natural, the expression of a physiological "potency" of every not fully differentiated cell. The factor of realisation alone is abnormal and pathological. Tumour formation is one of alternative innate reactions, the other of which is proliferation followed by differentiation as a physiological tissue, in wear and tear and in compensation for accidental loss, &c. It is the segregation of ever-present alternative potencies, as induced or realised by stimulation. This I regard as the mechanism of tumour formation, just as it is the mechanism of development and growth. The precise nature of its component reactions and their results are questions mainly for biology, and for chemistry and physics in the last resort. Many are beginning to be known.

We should bear in mind that tumour formation is the expression of a much less simple biological mechanism than the immediate reaction to an extrinsic stimulus. The generally enormous latent period of occupational cancer and of experimental tumour formation indicates this. Just as the advent of the kidneys, to take an example, is "prepared" by a long sequence of reactions in development, demonstrably beginning with metameric segmentation of the mesoderm if not sooner, and in the absence of any one of which there are no kidneys, so it may well be that tumour formation is the last of many successive reactions, the effect by summation of all those that have gone before.

I conclude that we know just as much of tumour formation as we can expect or be expected to know. Our knowledge is a pretty accurate measure of our ignorance of the mechanism of development and growth. Biology freely admits incompetence to

"explain" the "cause of life." Surely, the proper question for pathology to try to answer is not "what is the cause of cancer?" but "what is the biological mechanism of tumour formation?"

I am, Sir, yours faithfully,

G. W. NICHOLSON.

Guy's Hospital, S.E., Feb. 7th, 1932.

To the Editor of THE LANCET.

SIR,—Mr. J. J. M. Shaw, in his first article, suggests the possibility of the lowering of the anti-epithelial resistance in pregnancy to permit the invasion of the trophoblast. At that stage there is no continuity of tissue between uterus and ovum and nothing, one may suppose, to indicate the presence of a stranger requiring such accommodation. On the other hand the trophoblast, having eroded its way into the required position, disappears. May it not be that its presence acts as a stimulus to the production of an antibody which effectively destroys the invader, the occasional failure of such a reaction permitting chorion epethelioma? The blood-serum of early pregnancy might possibly show some action on living cancer cells.

I am, Sir, yours faithfully,

P. L. W. WILLIAMS, F.R.C.S. Edin.

Padstow, Feb. 5th, 1932.

THE SPAHLINGER REMEDIES.

To the Editor of THE LANCET.

SIR,—May I be allowed to clear up some of the misapprehensions which have crept into your leading article of Feb. 6th. It is quite true that, after having sent several commissions—one of which included the late Prof. Ritchie—to investigate my work, the British Red Cross offered me a sum of £30,000 for the right to distribute my preparations in the British Isles. Under the agreement I had one year within which to decide whether I was able to supply the large number of doses stipulated for each year. I found it impossible within that time to simplify the methods of production, as I had hoped, sufficiently to supply these large quantities; and therefore I availed myself of a clause in the agreement providing for its determination upon repayment, which I duly made, of the sum received plus interest. I am very anxious that the truth about the Red Cross agreement should be known in view of the absurd stories which have been circulated on that subject. When the Ministry of Health offered me facilities for "an independent experimental trial," my supply of complete preparations was exhausted through lack of funds, and that fact is officially recorded by the Ministry.

Coming to your comments on my formula, in which you find certain "lacunæ," I should like to say that I purposely refrained from describing any technical processes or data with which bacteriologists are familiar, because I was anxious not to be accused of belittling the knowledge and technique of contemporary research workers. At the same time I took pains to describe my method fully enough to enable competent bacteriologists to reproduce my vaccines. Let me, however, reply quite briefly to the points raised by you:

1. It is not usual to find "secondary organisms" in bovine tuberculous lesions; and with moderate skill, tubercle bacilli can be isolated from human lesions without recourse to "acid or alkali to destroy any stray secondary organisms, such as is the usual practice nowadays."

2. You ask what organs or tissues I use. Personally I prefer defibrinated blood, serum, or ascitic fluid. I only mentioned organ and tissue extracts in order to explain that these could also be used as media—as I have experimentally verified—provided they supply a specific *unaltered native* bovine or human fluid to the tubercle bacillus. For methods of extraction and filtration of organs and tissues I would refer to the orthodox text-books on the subject.

3. I do not restrict the use of glycerins, glucose, peptone, or distilled water (not "saline" a you say) to the "cultivation of human strains." These substances can also be used for the cultivation of bovine strains.

4. The "method of removal of oxygen" I did not describe in detail, because there are several and those are part of the usual bacteriological routine, when dealing with anaerobic conditions, or with the preparation of stable standards, or with toxins which easily oxidise, &c. I have made emulsions in vacuo—as you suggest—and in the presence of hydrogen with equally good results.

5. As to the "method of estimating the strength of the bacterial emulsion" may I explain that the emulsion is prepared in large enough quantities to be weighed in a sterile manner. The amount of vaccinating material can therefore be determined in fractions of weight. This point concerns not the method of preparation, but the application of the vaccine—i.e., the dosage. The dosage varies according to the degree of immunity required in the vaccinated animals and the severity of the infection to which such animals are subjected.

I intend shortly to publish the records of my experiments on cattle, giving complete details as to dosage, nature of antigens used in each test, number of injections, reactions, temperatures, autopsies, &c. The comparative results of these tests throw considerable light on immunity, allergy, and resistance increased or diminished by specific means.

I am, Sir, yours faithfully,

London, Feb. 9th, 1932. H. SPAHLINGER.

BRILLIANT GREEN FOR SYCOSIS.

To the Editor of THE LANCET.

SIR,—In your annotation with this title in the issue of Jan. 23rd (p. 202) you quote Prof. Senin as having found this dye a reliable remedy for sycosis, and myself as having studied its bactericidal action in high dilutions on streptococci. The letter of Dr. R. Prosser White (Jan. 30th, p. 261), commenting on this, attributes the virtues of Prof. Senin's brilliant green solution "largely" to the alcohol which it contains, and states further that alcohol is also "the chief active agent in the antiseptic use of tincture of iodine and picric acid." I cannot imagine that Dr. Prosser White has any authority for this statement. Alcohol is a weak germicide, as might naturally be expected from the fact that it is actually produced by bacterial action. My own results, detailed in the paper to which you referred, indicate that brilliant green, iodine, and picric acid are respectively 2000, 180, and 400 times more powerful as germicides than alcohol, judged by the maximum dilutions at which they were effective under the conditions of the tests made. That the conditions of practical use will reduce their efficiency is certain, but the same conditions militate against the successful action of alcohol, with the added disadvantage that evaporation terminates its action within a few minutes.

I draw attention to Dr. Prosser White's statement because it exemplifies an attitude which seems to me to stand in the way of progress in the use of germicides. The extraordinary bactericidal properties of brilliant green have been demonstrated repeatedly in the laboratory; by Prof. Senin's

observations, as by others, these properties are shown to have a valuable clinical application, and yet, it seems, the significance of their clinical results may be perverted, an explanation being substituted for which there is no experimental basis. I submit that chemical methods of combating infection should be based on accurate knowledge of the capabilities of the agent used for destroying the particular micro-organism concerned; if they remain, as they largely are now, a matter of personal taste, or of conventions dating from the past, the only prospect of improvement is by the process of trial and error, one which in therapeutics may be almost indefinitely prolonged.

I am, Sir, yours faithfully,

LAWRENCE P. GARROD.

Pathological Department, St. Bartholomew's Hospital, London, E.C., Feb. 8th, 1932.

THE PREVENTION OF DEAFNESS.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 30th, Mr. Macleod Yearsley takes me to task for a sweeping condemnation of the Zünd-Burguet and similar apparatus for re-education of the deaf. In so far as the statement was not made on personal experience I stand corrected. But, in making it, I was guided not only by the general attitude on the subject, but also by the personal experience of two friends who had tried the method as patients. Both of them are highly educated people, one a most observant medical practitioner. I am only too pleased to learn that their unsatisfactory experience is not universal, and I am obliged to Mr. Yearsley for drawing my attention to his handbook on the subject.

I am glad that Mr. Yearsley should regard me as a follower of himself and Dr. Kerr Love in preaching the prevention of deafness. Their pioneer work is widely known, if not suitably recognised. All who have the welfare of the deaf and the potentially deaf at heart know the vast difference that their work has made.

I am, Sir, yours faithfully,

Harley-street, W., Feb. 8th, 1932. MAURICE SORSBY.

THE ZÜND-BURGUET METHOD IN VERTIGO.

To the Editor of THE LANCET.

SIR,—It is encouraging to those who know and appreciate M. Zünd-Burguet and his method to find that the value of the Electrophonoïd is becoming more and more recognised in this country. I would like to endorse Mr. J. A. Keen's outspoken article on its use in the Ménière syndrome. Its value in the treatment of vertigo is pointed out in my *Manual* (written in collaboration with M. Zünd-Burguet and published in 1927) and I contributed a striking case in support of this in the *Practitioner*, in 1927. It may interest your readers and Mr. Keen if I briefly condense the main facts of this observation here.

Miss A.B., 21, became deaf in the left ear following an attack of acute middle-ear catarrh two to three years earlier. For two years she had suffered with increasing vertigo and underwent several time-honoured treatments without result. At the time she consulted me the vertigo had become so severe, causing her to fall to the right, that she feared to go out. The whisper hearing was reduced in the left ear to 2 feet. Romberg's test showed unsteadiness to the right. No nystagmus. No tinnitus. Electrophonoïd treatment was begun and the vertigo ceased before 15 sittings had been completed. It has never returned. At the end of 30 sittings the hearing was 12 feet. She had a later consolidating course of 20 sittings and the hearing increased to 15 feet. This highly satisfactory result has been maintained to the present date, and for three years she has been an enthusiastic mountaineer.

Since this case I have had three Ménière patients in all of whom the vertigo has speedily disappeared under the electrophonoïd treatment.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Harley-street, W., Feb. 6th, 1932.

METEOROLOGICAL FACTORS ON HEALTH.

To the Editor of THE LANCET.

SIR,—In the paper reported in your issue of Jan. 30th, the Director of the Meteorological Office, Dr. Simpson, concluded that the only recognisable influence of meteorological conditions on human health was the stimulation produced by the cooling effect of wind. How far we have travelled since I joined the profession, when the fevers and other disorders we met abroad were commonly ascribed to climate! Against that belief I always protested; it was so hopeless, discouraging all effort towards the prevention of disease. In a man-of-war one could get observations registering the meteorological conditions every four hours day and night. These I recorded regularly, and luckily we spent most of three winters in Malta harbour. At first one could come to no conclusions, but in 1887–88 and 1888–89 it appeared that if at any hour of the day a relative humidity of 80 per cent. was recorded, a case of sore-throat came for treatment the following morning: two coincident observations, meteorological and nosological. For years afterwards I kept logs for the Meteorological Office, who sometimes were good enough to lend me instruments, and besides made observations at other times for myself, but never obtained further coincidences of value. Those I mention from Malta, were made in a central-battery ship, without artificial ventilation, with some 650 men. Whether the humidity caused the disease, whether it was a measure of the stillness of the air in the thermometer screen, and so related with the poverty of ventilation in the ship below, I cannot say; but the coincidence did occur, there, and I have never since spent time in a harbour so airless, in so large a ship.

When I came home I sought for similar records of observations, and only found them in the "Practice of Medicine" of Dr. Aitken, then professor of medicine at Netley, who quoted them from Dr. Francis Home, surgeon to Cadogan's (6th) Dragoons, at Bois-le-Duc, in Flanders, in 1748. He thought humidity a prime cause of disease, which attacked especially troops in damp situations. He had a hydrometer, catgut. From June 29th to July 12th, dry weather, "no man taken bad." On the 12th, "my hydrometer fell very low," the distemper began; three men were seized with it, and others every day in the next week which continued damp; there were not so many in the dryer weather that followed, and so on.[1] I have a personal interest in these inconclusive observations, made as they were by my great-grandfather, and I have been unable to find others definitely paralleling meteorological observations with the incidence of disease.

As was remarked in the discussion on Dr. Simpson's paper, often empiricism comes by its own in the long run. We all feel the benefit of a bright dry day,

[1] Home, F.: Medical Facts and Experiments, London, 1759, pp. 61 and 62.

very likely during an anticyclone, when the denser air with the higher barometer buoys us up more, so we walk with less exertion than on a damp cold day with a low barometer—a day we describe as "heavy," though cubic foot for cubic foot the air is lighter; it is we who are less buoyed up, it is we who are heavier; and, besides, air saturated with moisture has a higher specific heat, and so more chilling effect. What we want is more observations of the association of certain meteorological conditions with increase or decrease of illness. Another question to be answered is the period of incubation or invasion of a nosological effect. It used to be said that as a cyclone swept over the United States, so it was followed by doctors' claims for medical treatment of the pensioners whose rheumatic pains had become exacerbated as the low pressure area reached them. But that was some years ago, and I have not heard about that lately. There is much more to learn about the influence of weather on health. It is a pity more detailed observations are not made.

I am, Sir, yours faithfully,

Southborough, Jan. 30th, 1932. W. E. HOME.

CANCER OF THE LUNG.

To the Editor of THE LANCET.

SIR,—In a letter published in your issue of Jan. 30th, Dr. Ellman expresses surprise that no reference was made to a book by Dr. Maurice Davidson in an annotation on cancer of the lung published in your issue of Jan. 23rd. Are we not too apt to overlook important work which is done in this country and to place too much importance on foreign medical literature? The amount of literature is so appalling that its very size is apt to clog rather than hasten the wheels of progress.

I am reminded of a review of some medical work in which the author was criticised for failing to give reference to some foreign work of minor importance. I noticed that the author had also failed to give any reference to a recent and important English work on the same subject, but upon this fact the reviewer omitted to comment. It has been said that in England one has but to add "Offski" to one's name to get a following, and it is certainly a peculiarity of the English to belittle themselves. Only the other day I read in an evening paper complaints about the smoke or dirt in the sleeping-cars of English railways. In America they find it necessary to use wire gauze netting over the railway carriage windows, and even this fails to keep out the smuts. On the continent the trains, and even the luxury trains in which I have travelled, are no cleaner and undoubtedly far less steady than are the trains in this country, yet the average Englishman is always ready to compare his railway or other services unfavourably with other countries. If one pointed out to an American that the trains in that country started and stopped with a series of jerks like an old-fashioned luggage train he would be genuinely offended. As far as I am aware, in no other country but England do people take a delight in belittling themselves.

It would be interesting to hear what modern psychologists have to say about it. I have heard it suggested that it is a form of superiority complex; the Englishman really being completely convinced that he and his country are in every way superior to all others.—I am, Sir, yours faithfully,

L. S. T. BURRELL.

Chandos-street, Cavendish-square, W., Feb. 1st, 1932.

THE CAUSATION OF CHRONIC GASTRO-DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—I am very grateful to you for the review of my book which appeared in your issue of Jan. 30th (p. 248), and perhaps you will permit me to comment on some of the points raised by your reviewer. I agree that experimental proof in support of my theory would have clinched my argument, but is it always possible or even necessary to prove experimentally a theory before publishing it? I may add, however, that I am at present engaged in experiments which I hope to bring to a successful conclusion, and which will include the verification of G. M. Smith's work (*Journal of Medical Research*, 1914, XXX., 147) quoted at length in my book and which I consider to be of crucial importance.

Your reviewer also says that admittedly good results have been obtained by methods which are partially or wholly opposed to my theory. I think that most general practitioners and all surgeons will refute the first part of this statement. As to the second part, I have endeavoured to show that *two* factors are concerned in the production of peptic ulcers—namely, (1) bile, and (2) hydrochloric acid, and since present-day medicinal treatment consists mainly in the administration of large and frequent doses of alkali, it will be obvious that this treatment abolishes the essential acid factor; hence the temporary improvements and so-called cures which only last as long as treatment is persevered in.

Although your reviewer has not discussed the details of my theory, perhaps you will allow me to mention that before embarking on the involved problem of the mechanism of the formation of chronic peptic ulcers, I have postulated a new conception of the pathology to differentiate between the acute and chronic peptic ulcer which, in my opinion, must form the starting point in the study of this most urgent problem.

I am, Sir, yours faithfully,

J. JACQUES SPIRA.

Half Moon-street, W., Feb. 6th, 1932.

TUBAL PREGNANCY.

To the Editor of THE LANCET.

SIR,—Before you in your wisdom close this correspondence, may I say that my clinical note was as brief as possible because I merely wished to draw attention to the discoloration of the abdominal wall, and therefore did not give a detailed description of the operation.

Thanks to the courtesy of Prof. Miles H. Phillips, I now know that the sign is rare, may have no direct connexion with the presence of blood in the peritoneal cavity, and indeed may occur where there is no hæmorrhage. Prof. Phillips also very shrewdly suggests that the bruising of the abdominal wall may be due to external manipulations, and in favour of this is the rareness of bruising in tubal rupture.

I must thank Mr. Goodwin for his solicitude on my behalf because of the onslaught of Prof. Blair Bell. Under any circumstances my reverence of you, the knowledge that THE LANCET is on the desks of Editors of Standing throughout the world, and, above all, a sense of humour curb me from giving "reins and spurs to my free speech." I know Prof. Blair Bell does not believe a word I write, but he does not believe anybody very readily, and however forcibly he may express himself such a controversalist does stimulate even if he may cause a little pain.

In fairness to Prof. Blair Bell it must be pointed

out that Cullen preserved the tube in his patient with a tubal pregnancy. In my patient there was active bleeding, the tube was ruptured, and the peritoneal cavity was sufficiently full of blood to cause abdominal distension and moveable dullness in both flanks.—I am, Sir, yours faithfully,

W. E. TANNER.

Queen Anne-street, W., Feb. 6th, 1932.

To the Editor of THE LANCET.

SIR,—I should like first to express my regret that Prof. Blair Bell should have misconstrued the meaning of the opening paragraph of my letter. No one reads his articles with greater interest than I; there is a refreshing originality about them, and they open new avenues of thought as well as giving many useful suggestions about treatment, though they necessarily must be controversial at times. It is to this very originality that I was trying to pay compliment.

I think he is a little hard on Mr. Tanner, when one considers that he did not see the specimen or the condition of the abdomen when it was opened. Surely, if Mr. Tanner says that the abdomen was filled with blood, it must have been. This is not an uncommon sight in London, but perhaps our women bleed more freely than they do elsewhere. I think he must be congratulated on having adopted the quickest surgical procedure consistent with safety in this case.

My "elementary" questions were asked in the hope that I might learn something which might help me in the future, but the answers to them, and the bibliography referred to in the text of Prof. Blair Bell's letter, leave me what I was when I first wrote —an unregenerate gynæcologist.

I am, Sir, yours faithfully,

AUBREY GOODWIN.

Queen Anne-street, W., Feb. 6th, 1932.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 16th, Mr. W. E. Tanner reported a case of ruptured tubal gestation with bruising in the umbilicus and on the abdominal wall, and remarked that he could not find a record of any similar case. The bruising and discoloration of the umbilicus and skin of the anterior abdominal wall was described by Cullen several years ago, and is known in this country as "Cullen's sign." Any free bleeding in the peritoneal cavity may give rise to this sign, hence it is not pathognomonic of ruptured tubal pregnancy. I, personally, have only seen it once in a large number of cases of ruptured ectopic gestation.—I am, Sir, yours faithfully,

A. J. GORDON, M.D., F.A.C.S.,
Associate Attending Gynæcologist, Newark City Hospital.

Feb. 2nd, 1932.

COST OF MOTOR ACCIDENTS TO HOSPITALS.—Last year 50 road accidents were admitted to the Horton General Hospital, Banbury, as compared with 26 in 1930. Of these accidents 27 were to riders of motor-cycles. It was stated at the annual meeting that two cases cost over £300. The East Suffolk and Ipswich Hospital last year admitted 109 motor-accident patients, who stayed for an aggregate of 3155 days. The average stay of an in-patient in this institution is slightly under 19 days, but these averaged 30 days. They cost £1419, and £136 was recovered from the insurance companies; the patients gave £92. Analysis of the cases shows that 12 were motor-car drivers and passengers, 36 motor-cyclists and pillion-riders, and 61 pedestrians. It is pointed out that the Road Traffic Act makes no provision for subsequent treatment in the out-patient and special departments, nor for the cost of transport, which at Ipswich exceeded £38.

OBITUARY

ROBERT STENHOUSE WILLIAMS,
M.B., B.Sc. Edin., D.P.H. Camb.

Dr. Stenhouse Williams, Director of the National Institute for Research in Dairying at Reading, died on Feb. 2nd in University College Hospital, London, where he was taken unconscious after an apopletic seizure on the Irish mail train. He was in his sixty-first year and, although obviously frail, was carrying on his work at full pressure until the previous day. His death removes a remarkable personality, and one which achieved much by devotion to a cause—namely, the production of clean milk.

Dr. Williams was born and brought up in Liverpool, commencing his medical study there and completing it in Edinburgh, where he qualified in 1896 and took the higher degrees in 1902. He then returned to Liverpool as assistant superintendent of the Institute of Comparative Pathology, later becoming bacteriologist to the David Lewis Northern Hospital, and lecturer on public health bacteriology in the University. For some years he was assistant physician to the Stanley Hospital and to the Hospital for Consumption, and at various times he held a number of teaching appointments and contributed freely to the literature of experimental and clinical pathology. In 1912 he was called to Shinfield, near Reading, to direct the research institute founded by the Ministry of Agriculture and Fisheries, and governed by a board representing the Ministries of Health and Agriculture, as well as the organised farming and dairying associations. For 20 years he directed this Institute with its five departments of bacteriology, chemistry, husbandry, physiology, and dairying, with the aid of a band of workers who were in course of time drawn into the University of Reading, Dr. Williams himself being given the chair of research in dairy bacteriology. An account of his work may be given in the words of one of his close associates, Dr. E. C. G. Maddock, honorary research fellow. Dr. Maddock writes:—

DR. STENHOUSE WILLIAMS.

"Stenhouse Williams may be called the founder of the Clean Milk Movement in this country. From the very beginning he realised that the Ministries of Health and Agriculture must work together to this end, and he was always loyally helped by members of the veterinary profession, who responded to his enthusiasm. With his natural thoroughness he decided that for milk to be delivered clean the process must begin with the cow and the milker, and be on such a practical basis that it could be followed by the ordinary dairy farmer. At Shinfield he began work in the old farm cowshed, and by expending only five pounds on concrete floors, efficient lighting, drainage, and ventilation, demonstrated that clean milk could be produced through the hottest weather as long as the cows and milkers were clean and the vessels used were sterilised. Critics said it was impossible to get the dairy farmers to follow his

methods. Patience, unfailing kindliness, the faculty of always realising and understanding another man's point of view, combined with practical demonstration and help, quickly convinced an ever-increasing number of dairy farmers round Reading that the application of science was not a fantastic folly, but a saving of hard cash as their milk kept longer. From these beginnings he followed the milk through its various stages to the time it was delivered to the consumer. The retailers were quickly convinced that scientific methods were a practical and money-saving proposition.

"The ideal Williams aimed at was to free, in time, the country of bovine tuberculosis, so that fresh milk could be safely drunk. There was no doubt in his mind that there are properties in raw milk that are destroyed by heating, and he bewailed the fact that practical research on these properties has been so neglected. His loyalty and devotion to his staff was only equalled by theirs to him. He refused absolutely to take any credit to himself for work done by others, and insisted on each one having his share, including the laboratory assistants. On the other hand, not a particle of work was allowed to be published that could not stand up to any criticism directed against it. He had a great sense of humour and a charming twinkle in his eye which endeared him to his friends, children, and animals. If anyone was in trouble of any kind he would never spare himself or his pocket to do what he could to help. His health, never robust, was seriously affected by a gastric operation some years ago, and by constant lecturing all over the British Isles he overdid his strength. Latterly he had been terribly worried by the reduction in the salaries of his staff and the constant strain of obtaining enough money to carry on the Institute."

It remains to put on record Dr. Williams's love of nature in all its moods which led him to find his chief recreation in climbing, and no doubt influenced him in giving up an academic career in Liverpool for one more in contact with animals and growing things.

While in Liverpool he married Helena Margaret, daughter of Thomas Crosfield, and he leaves two sons and a daughter.

THE LATE COLONEL S. F. LOUGHEED, R.A.M.C.

Major-General Edgar M. Pilcher writes: Will you allow me space for a few grateful and appreciative words to the memory of Colonel S. F. Lougheed, of the Royal Army Medical Corps, whose death was announced last week? Lougheed was prevented by chronic and persistent ill-health from rising to the top of his service, but he was one of those whose spirit triumphs over the frail body, and to a small band of workers, of whom I am proud to have been one, he was a perpetual inspiration. Invalided from India in 1894, he wasted no time in self pity or futile search for amusement, but set himself to a course of post-graduate study at the West London Hospital, and found the work most suited to his taste in the surgical clinic of the late Mr. Leonard Bidwell. Lougheed had beautiful hands and a real flair for surgery, and when his appointment to the Royal Arsenal at Woolwich gave him opportunity to practise he showed that he could not only operate but teach. Those of us who came within the range of his influence will bear me out when I say that surgery in the Army, gradually arising from a very dark age, took much of its inspiration from the enthusiasm and personal example of Samuel Lougheed.

PARLIAMENT

NOTES ON CURRENT TOPICS.

GOVERNMENT'S TARIFF POLICY.

ON Thursday, Feb. 4th, the House of Commons went into Committee of Ways and Means (Sir D. HERBERT, Chairman of Committees, in the chair) on the first of a series of resolutions connected with the Government's Trade Bill.

Mr. NEVILLE CHAMBERLAIN, Chancellor of the Exchequer, in moving the resolution, said that, so far, the Government had averted disaster to the country; now they were beginning constructive work. They had succeeded at least in improving the situation since last November. The emergency Budget might have been thought unrealisable, but, while he could not guarantee final results at that stage, the collection of income-tax was 50 per cent. higher than last year, and, if companies followed the magnificent lead of individual taxpayers, the yield would more than compensate for losses on other taxes. The cost of living had been unaffected by the fall in the external value of the pound sterling, and was actually six points lower than on Jan. 1st, 1931. Sterling, too, had shown gratifying stability. There had also been a definite improvement in trade in certain directions.

There was no use, however, in pretending that the country had turned the corner. Apart from other important considerations, the trade balance was still adverse. Taxpayers could not be heroes indefinitely; taxation could not remain indefinitely at a crippling level. A credit balance of trade of £100,000,000 in 1929 had become an adverse balance of £113,000,000 in 1931. The problem was to increase exports and to diminish imports. A policy must be chosen which offered the greatest balance of advantages over disadvantages. The scheme chosen had seven objects: (1) the correction of the balance of trade; (2) the raising of revenue without imposing undue burdens on any section of the community; (3) moderate and scientific protection to transfer production to our own fields and factories; (4) encouragement of industrial efficiency; (5) promotion of tariff agreements with foreign countries; (6) retaliation against foreign tariff discrimination; (7) advancement of Imperial economic partnership. The basis of the scheme was a general tariff of 10 per cent. modified by a short free list, which included wheat, meat, fresh fish of British taking, raw cotton and wool, and tea. The 10 per cent. would not be added to existing duties and existing Acts imposing them would continue until replaced by something else. Neither the new general, nor the new specific duties, would apply to goods from the Dominions, at least pending the results of the Ottawa Conference. All produce from colonies, protectorates, or mandated territories would also be exempt. If any foreign countries discriminated against British goods the Board of Trade would have power to impose duties up to 100 per cent. on their goods. After the Ottawa Conference there would also be power to offer reciprocal lowering of tariff barriers to foreign countries.

After considerable discussion the debate on the first resolution was adjourned.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 3RD.

Street Accidents.

Mr. BUCHAN-HEPBURN asked the Home Secretary whether he could give any information, in advance of the annual return which was presented to Parliament, of the number of street accidents caused by vehicles and horses in 1931, which resulted in personal injury and came to the notice of the police.—Sir H. SAMUEL replied: The following are preliminary figures as to street accidents caused by vehicles and horses during 1931, which resulted in personal injury,

and came to the notice of the police:—The total number of such accidents recorded in Great Britain was 181,486, of which 6495 resulted in fatal injuries to one or more persons. The corresponding figures in 1930 were 156,793 and 7074 respectively. The number of persons killed in 1931 was 6685 and 202,147 injured, as against 7305 and 177,895 respectively in 1930. There was thus in 1931 a considerable increase in the total number of accidents resulting in personal injury which were recorded by the police, but a decrease in the number of fatal accidents as compared with 1930. The figures for England and Wales show similar changes, the total number of accidents resulting in personal injury being 165,531 (an increase of 23,127), and fatal accidents 5851 (a decrease of 466). The total number of persons killed or injured in England or Wales was in 1931 190,831 (an increase of 22,329), and the number killed 6026 (a decrease of 496). These changes in the number of persons killed and injured respectively suggest that the increase in the total number of accidents resulting in personal injury may be more apparent than real, and attributable to the police obtaining fuller information regarding the accidents which occur by reason of the institution of the motor patrols and the new requirements of the road traffic Act as to the reporting of accidents. The figures from many police districts support this view, but it is to be noted on the other hand that those for the metropolitan police district show a decrease in the total number of persons injured, as well as a decrease in the number killed, the totals for 1931 being 1324 killed and 54,422 injured (not fatally), as against 1398 and 55,827 respectively in 1930. On the other hand, in some police districts, including, for instance, parts of Kent and the West Riding of Yorkshire policed by the county police, there was an increase in 1931 in the number of persons killed as well as in the number of persons injured. Amongst the cities and boroughs in England and Wales, Birmingham had the highest total of killed or injured during 1931—namely, 5688, an increase of nearly 800 over the previous year. This figure, however, is exceeded by Glasgow, where the number of persons killed or injured was 5904, which is, however, nearly 300 less than in 1930. The Liverpool figures show an increase in persons killed or injured from 4447 to 4648, and those for Manchester an increase from 3571 to 3848. Wales, as a whole, had a total of 232 killed and 7422 injured, as compared with 270 killed and 5816 injured during 1930. In Scotland the corresponding totals show a decrease of 124 killed and an increase of 1427 injured, the totals for 1931 being 659 and 17,342 respectively.

Rates of Relief.

Mr. ALBERY asked the Minister of Health what steps had been taken to prevent differentiation in the rates of relief paid in areas where similar conditions prevail.—Sir E. HILTON YOUNG replied: The amount of relief to be afforded is for the decision of the public assistance authority in the light of the ascertained needs of the individual case. I have no power either to require uniformity or to define what, for the purpose of assessing relief, are similar conditions. As regards the area to which my hon. friend called my attention in an earlier question, I am informed that the local authority have taken action to remove the difficulty to which he referred.

Maternal Mortality.

Mr. MCENTEE asked the Minister of Health when the publication of the report of the departmental committee on maternal mortality might be expected.—Sir E. HILTON YOUNG replied: The interim report of this committee was published 18 months ago. I have not yet received any further report, but I understand that the committee hope to present their final report very shortly.

Rural Housing.

Mr. HURD asked the Minister of Health the number of rural district councils in England and Wales who made applications for special Exchequer assistance under the provisions of the Housing (Rural Authorities) Act, 1931; the total number of houses included in their proposals; and the number of houses which the Central Advisory Committee had recommended for erection under this Act.—Sir E. HILTON YOUNG replied: Applications have been received from 145 rural district councils of which six were subsequently withdrawn. The remaining 139 applications were in respect of 6735 houses. The committee are not yet in a position to make actual recommendations. They have informed 97 authorities that they are prepared to entertain applications to the extent of 1591 houses for the agricultural population.

Pensions for Nurses.

Dr. O'DONOVAN asked the Minister of Health if he was able to give the details of existing arrangements for the interchangeability of pension schemes for nurses, sisters, and matrons in municipal hospitals; and if he would be prepared to coördinate the nurses' pension schemes in federated voluntary hospitals and in municipal hospitals.—Sir E. HILTON YOUNG replied: I would refer my hon. friend to the provisions of the Local Government and Other Officers' Superannuation Act, 1922, and particularly to Section 8 and 16 of that Act. I am, as my predecessors have been, willing to consider any practicable proposal on the lines mentioned in the second part of the question, but no such scheme has as yet been submitted.

MONDAY, FEB. 8TH.

London Tube Workers and Asbestosis.

Dr. O'DONOVAN asked the Home Secretary if he was advised that the precautions taken to prevent fatal lung disease in workers lining London tubes with asbestos were adequate.—Sir HERBERT SAMUEL replied: I have no powers of control in respect of this work under the Factory or other Acts, and have no information at present as to the precautions taken. I will make inquiries, however.

G.M.C. and Indian Medical Degrees.

Mr. THOMAS GRIFFITHS asked the Secretary of State for India what was the present position in regard to the recognition by the British Medical Council of degrees granted by the faculties of medicine in Indian universities; and what stage had been reached in the setting up in India of an Indian Medical Council.—Sir S. HOARE replied: The conditional recognition accorded by the General Medical Council to the medical degrees of certain Indian universities was withdrawn in March, 1930. A revised draft Bill for the establishment of an All India Medical Council has been prepared, and it is hoped to introduce it in the Indian Legislative Assembly at an early date.

Importation of Boneless Meat.

Lord SCONE asked the Minister of Health if he would consider the advisability of prohibiting the importation of boneless meat, in view of the difficulty of detecting unsoundness or disease in such meat.—Mr. ERNEST BROWN (Parliamentary Secretary to the Ministry of Health) replied: The importation of boneless meat which affords insufficient means of identification with definite parts of a carcass is prohibited under the Imported Food Regulations of 1925. My right hon. friend is now considering the amendment of these regulations so as to require a recognised official certificate of the country of origin with all imports of fresh meat less than the whole carcass.

TUESDAY, FEB. 9TH.

Boys Working Underground at Night.

Mr. TINKER asked the Secretary for Mines if he had considered the request from the Miners' Federation of Great Britain to meet them to discuss the position of boys under the age of 16 years working underground on night shifts; and if he was prepared to meet them.—Mr. ISAAC FOOT replied: The answer to both parts of the question is in the affirmative.

Safety in Mines.

Mr. TINKER asked the Secretary for Mines how many safety-in-mines conferences had been held; was it his intention to have the proceedings and subjects that were discussed published and available to mine workers; and if it was his intention to hold similar conferences.—Mr. ISAAC FOOT replied: The sixth district Safety Conference was held at Nottingham last Saturday, and was attended by some 4000 persons representative of all interests in the mining industry. I intend to hold another conference at Swansea in March, and the eighth and final conference probably at Birmingham in April. Every mining area in the country will then have been covered. The proceedings at these conferences are well reported in the local press; and the material is used in the various safety publications of my department, and in the lectures and demonstrations on a smaller scale by which the work of these large conferences is being followed up.

Sunday Repairs to Telephones.

Mr. HUTCHISON asked the Postmaster-General whether, in view of the fact that no telephone repairs were carried out between 1 P.M. on Saturday and Monday morning, except in the case of those telephones belonging to doctors, this privilege could be extended to the general public, seeing that no money was refunded in respect of the period in which their telephones were out of working order.—Mr. WHITE, Assistant Postmaster-General, replied: The present arrangements for fault repair during week-ends apply not only to the circuits of doctors, but also to fire alarm, police, hospital, and other circuits where the immediate restoration of communication is in the general public interest. My right hon. friend is considering whether it is possible to extend their scope.

Cancer among Welsh Nickel Workers.

Mr. DAVID GRENFELL asked the Home Secretary whether he had received notification of the deaths from cancer among men employed at the Mond Nickel works at Clydach, near Swansea, and the number of deaths from this cause during the last three years among men who had been employed at these works prior to their disablement.—Sir H. SAMUEL replied: Notification under the Factory Act is required only in the case of cancerous ulceration of the skin due to tar, pitch, or certain other substances. No cases of this form of cancer have been notified from the works in question, and I am informed that, so far as the Factory Department is aware, there is no process carried on at the works which would expose the workers to this risk. At the request of the Department the Medical Officer of the Company has gone through their records, and finds that during the last three years six men who had been employed at the works died from cancer, but there does not appear to be any ground in any of these cases for connecting the disease with the employment. The average number of men employed during the three years was 1105. The average age of death in the six cases was 53.

Mr. GRENFELL asked if the figures given were not indicative of a very high rate of cancerous deaths, especially in view of the form of cancer which attacked all these people, which was the same kind in each case.

Sir H. SAMUEL: No. I am informed that the number of deaths is not disproportionate to that in the population generally, nor do any particular cases show symptoms of the particular kind of cancer which is due to industrial disease.

Mr. GRENFELL asked the right hon. gentleman to keep a watchful eye on the subject, and to keep as accurate a record as possible of the number of cancerous cases at these works.

Sir H. SAMUEL said that very full and careful inquiries had been made. If Mr. Grenfell would give him information which would show that these cases—six in the last three years out of 1100 workmen—were due in any degree to their employment he would be most happy to look into the matter.

Continental Vegetables and Foot-and-mouth Disease.

Major CARVER asked the Minister of Agriculture if his department had investigated the possibility of foot-and-mouth disease in this country being due to the importation of Continental vegetables; and, if so, what was the result of such investigation.—Sir J. GILMOUR replied: Inquiries are made into the source of infection in every outbreak of foot-and-mouth disease. While it is of course possible that the disease may be introduced by imports of vegetables, or of other commodities, in no case has it been established that infection was definitely attributable to the importation of Continental vegetables, and no evidence has yet been forthcoming which would justify the prohibition of such imports on these grounds.

Lieut.-Colonel FREMANTLE asked whether this subject had been referred to the newly constituted Agricultural Research Committee.

Sir J. GILMOUR said that very definite inquiries were always going on into foot-and-mouth disease.

Milk for School-children.

Mr. MCENTEE asked the President of the Board of Education how many local education authorities were providing milk for school-children, excluding National Milk Publicity Council schemes; and the number of children supplied with milk through the National Milk Publicity Council schemes at the latest convenient date.—Mr. RAMSBOTHAM, Parliamentary Secretary to the Board of Education, replied: During the week ending Jan. 23rd last, 81 local education authorities in England and Wales were providing milk for school-children under Sections 82 and 85 of the Education Act, 1921. My right hon. friend understands from the National Milk Publicity Council that about 800,000 children are receiving milk under their schemes.

Local Authorities and Slum Clearance.

Dr. SALTER asked the Minister of Health the number of local authorities in England and Wales who had submitted clearance orders for confirmation under the Housing Act, 1930; the number of such clearance orders that had been actually confirmed by him at this date; and the number of houses and other buildings which would be demolished as a consequence of such clearance orders.—Mr. E. BROWN replied: Up to Jan. 31st last 51 local authorities in England and Wales had submitted clearance orders under the Housing Act, 1930, for areas containing 3681 houses, and 44 clearance orders had been confirmed.

MEDICAL NEWS

Royal Colleges of Physicians of London and Surgeons of England.

At the Final Examination of the Conjoint Board held from Jan. 11th to Feb. 3rd the following candidates were approved in the subjects indicated, but are not yet eligible for diplomas:—

Medicine.—A. L. Abeyewardene, L.M.S. Ceylon, Univ. Coll.; P. Baron, M.B. Cape Town; G. P. Barua, M.B. Calcutta, London; C. G. Batty-Smith, Camb. and St. George's; S. J. Bellgard, L.M.S.S.A. Lond., St. Mary's; F. C. Bourgault du Coudray, London; M. J. Brookes, London; J. D. Burrows, St. Thomas's; T. Chadderton, Manchester; N. C. Coombs, Camb. and Bristol; D. R. Crabb, St. Bart.'s; J. M. Cribb, Cardiff; W. H. D. Davies, St. Bart.'s; Mary T. Day, Charing Cross; H. De, St. George's; L. Dexter, St. Bart.'s; G. E. Dunkerley, Univ. Coll.; W. G. Evans, Camb. and St. Mary's; K. Fawcett, St. Thomas's; Catherine F. Forrest, Royal Free; A. E. Francis, St. Bart.'s; R. G. Gilbert, St. Bart.'s; J. A. S. Goonawardena, L.M.S. Ceylon, Univ. Coll.; R. J. C. Hamilton, St. George's; O. C. Hamilton-Jones, Liverpool; G. R. Hargreaves, Univ. Coll.; F. R. Hayward, Guy's; J. S. Horsley, London; A. D. Iliff, St. Bart.'s; D. H. Irish, Guy's; L. S. Jaikaran, London; R. James, St. Mary's; T. B. Jones, Westminster; Agnes V. Kelynack, Royal Free; R. Kempthorne, Oxf. and Univ. Coll.; R. Knox, Oxf. and St. Bart.'s; R. A. Manclark, Middlesex; J. de C. Muller, St. Thomas's; W. Mushin, London; K. H. Nassif, Royal Free; H. E. Offord, St. George's; G. B. Palmer, L.D.S. Eng., Guy's; O. R. L. L. Plunkett, St. George's; S. Rameshwer, M.B. Lucknow; A. Rashid, West London; H. M. Rashid, Birmingham; S. R. H. Razwi, London; L. J. Richmond, M.B. Leeds; D. F. Robb, St. Thomas's; G. C. Sawyer, Guy's; B. H. Sayed, M.B. Punjab, St. George's; E. F. Scowen, St. Bart.'s; E. J. Somerset, King's Coll.; Charlotte M. H. Sparrow, Royal Free; J. W. C. Symonds, St. Bart.'s; J. R. Thornton, St. Thomas's; J. B. L. Tombleson, St. Thomas's; C. M. Vaillant, Oxf. and Liverpool; E. J. Walsham, St. Thomas's; E. W. Wilkins, Birmingham; V. F. F. Winslow, St. Bart.'s; S. W. Wright, Guy's; and M. Zinober, Cape Town.

Surgery.—S. D. Ahuja, M.B. Punjab, Charing Cross; J. C. G. Anderton, Camb. and Westminster; S. T. Anning, Camb. and Leeds; H. J. B. Atkins, B.A. Oxf. and Guy's; C. G. Barnes, St. Mary's; J. R. Blackburne, St. Bart.'s; R. W. W. Boss, Camb. and London; H. W. L. Broadbent, Camb. and St. Mary's; G. H. Brookman, St. Bart.'s; J. Cann, Camb. and St. Thomas's; D. B. Cater, Camb. and Charing Cross; I. A. Cathie, Guy's; A. H. Chenard de la Giraudais, Charing Cross; S. J. Chesser, Camb. and St. Thomas's; N. G. Chitnis, Bombay and Dublin; C. A. Clarke, Camb. and Guy's; Gwendolen N. Cook, Royal Free; P. T. Cooper, Camb. and St. George's; F. N. Corfe, L.D.S. Eng., Guy's; A. G. Cowie, St. Mary's; G. W. Crimmin, Camb. and St. Thomas's; P. N. Cutner, M.B. Edin.; J. E. Davenport, Camb. and London; A. M. Davies, Bristol; J. Davies, London; E. A. Devenish, Univ. Coll.; L. W. B. Dobbin, Camb. and London; G. M. Evans, Bristol; Q. F. Evans, St. Thomas's; W. B. Evans, Camb. and St. Bart.'s; J. H. Fisher, Camb. and London; J. F. P. Forster, Birmingham; M. Fröhlich, Middlesex; W. H. Gabb, Camb. and St. Bart.'s; G. D. Galwankar, Bombay; G. H. Gibbens, St. Thomas's; K. J. Gilchrist, Guy's; W. G. Gill, Camb. and Guy's; A. J. Grace, Guy's; L. Greenfield, London; C. S. Hall-Smith, Camb. and St. Bart.'s; J. Halperin, St. Bart.'s; J. C. Hardy, Univ. Coll.; E. R. Hargreaves, Camb. and St. Mary's; C. L. Hay-Shunker, St. Bart.'s; R. A. P. Hogbin, Guy's; M. D. C. Hosford, St. Bart.'s; Ursula Y. im Thurn, Univ. Coll.; C. G. Jones, Middlesex; T. B. Jones, Camb. and St. Thomas's; W. W. Jones, Guy's; R. Kempthorne, Oxf. and Univ. Coll.; W. Kravchick, St. Bart.'s; C. B. Lanyon, Univ. Coll.; A. R. R. Le Fleming, Camb. and St. Thomas's; A. W. D. Leishman, Oxf. and St. Bart.'s; A. A. Lewis, Guy's; P. Lewis, Leeds; J. L. Lovibond, Camb. and Middlesex; D. C. McClure, London; D. B. McGavin, M.B. Camb., St. Bart.'s; M. B. McGinn, London; Mary A. McKean, Royal Free; S. O. Massey, Middlesex; F. S. A. Maw, Camb. and King's Coll.; A. R. R. Mears, Camb. and St. Bart.'s; R. V. F. Mercer, Camb. and St. Bart.'s; J. A. W. Miller, Guy's; T. D. F. Money, Camb. and St. Thomas's; W. H. W. Morris, St. Thomas's; Alice M. Naish, Camb. and Royal Free; W. T. North, Guy's; J. A. Nunn, Oxf. and St. Bart.'s; J. Parkes, Camb. and St. Thomas's; R. V. Payne, Camb. and Guy's; R. E. J. Pembrey, St. Thomas's; S. H. B. Platts, Camb. and Leeds; C. B. R. Pollock, Guy's; V. T. Powell, Cardiff; J. C. Read, L.D.S. Eng., Guy's; R. G. Reid, Guy's; J. P. Reidy, Camb. and London; L. O. Roberts, St. Bart.'s; M. L. Rosenheim, Camb. and Univ. Coll.; A. Rothwell, Camb. and King's Coll.; M. H. P. Sayers, St. Thomas's; B. Shanovitch, London; I. Singh, M.B. Punjab, London; F. J. Sladen, Middlesex; S. B. Smith, Guy's; J. R. Strong, St. Bart.'s; Annie C. Taylor, Camb. and Univ. Coll.; E. H. Thierry, Univ. Coll.; C. W. Thomas, Camb. and St. Thomas's; A. S. Thorley, Univ. Coll.; H. A. Treble, Oxf. and Guy's; J. T. Turner, Camb. and St. Thomas's; J. M. Vaisey, Camb. and London; O. J. Vaughan-Jackson, Oxf. and London; A. R. Walters, Middlesex; C. B. M. Warren, Camb. and St. Bart.'s; Phyllis E. Watson, Camb. and Charing Cross; G. D. Wedd, Camb. and St. Bart.'s; H. D. White, Camb. and St. Bart.'s; H. M. Williams, St. Bart.'s; A. L. Winner, Univ. Coll.; T. G. R. Woods, St. Bart.'s; H. W. Wykes, Middlesex; and M. Zinober, Cape Town.

Midwifery.—A. L. Abeyewardene, L.M.S. Ceylon, Univ. Coll.; E. H. Allen, St. George's; S. T. Anning, Camb. and Leeds; K. S. Ayyar, M.B. Madras, Middlesex; C. G. Baker,

L.D.S. Eng., Guy's; J. B. Bamford, St. Bart.'s; V. H. Barnett, Univ. Coll.; P. Baron, M.B. Cape Town; Mavis W. M. Beddall, Univ. Coll.; R. B. Bell, Middlesex; E. V. Bevan, Camb. and St. Mary's; J. D. H. Bird, King's Coll.; M. S. W. Bisdee, St. Mary's; R. Biswas, M.B. Calcutta, Univ. Coll.; W. D. Bower, Camb. and St. Thomas's; H. W. L. Broadbent, Camb. and St. Mary's; E. N. Brockway, St. Thomas's; T. Bromberg, St. Mary's; R. C. Brown, St. Thomas's; Lilian M. Buxton, Birmingham; T. A. R. Callender, London; W. R. Cambridge, Bristol; L. I. S. Campbell, Guy's; W. H. Cartwright, St. Bart.'s; T. Chadderton, Manchester; B. Chandra, M.B. Bomb., King's Coll.; T. L. Chester-Williams, St. Bart.'s; E. M. Clark, St. Bart.'s; K. R. D. Coles, Guy's; G. H. Cooray, Univ. Coll.; A. C. Cox, Oxf. and Guy's; J. M. Cribb, Cardiff; C. F. Cumings, King's Coll.; J. Cunard, Guy's; P. N. Cutner, M.B. Edin.; Phyllis E. Dain, Birmingham; B. R. Das, M.B. Calcutta, St. George's; J. Davies, London; Ursula D'Monte, M.B. Bomb., Royal Free; D. P. Dewe, Bristol; R. C. Evans, Univ. Coll.; W. B. Evans, Camb. and St. Bart.'s; R. M. Farrington, Cardiff; T. Fichardt, Guy's; J. H. Fisher, Camb. and London; D. H. Fulton, King's Coll.; G. Gimpelson, King's Coll.; A. J. Grace, Guy's; E. N. Hailey, Birmingham; J. Halperin, St. Bart.'s; O. C. Hamilton-Jones, Liverpool; E. R. Hargreaves, Camb. and St. Mary's; H. C. A. Harris, Camb. and St. Thomas's; Helen A. Hatrick, Univ. Coll.; Anne E. M. Herbert, King's Coll.; C. A. Hodges, St. Thomas's; Phyllis L. Holliday, Camb. and Leeds; J. S. Horsley, London; A. W. J. Houghton, St. Bart.'s; J. Howkins, Middlesex; N. D. Jekyll, London; W. A. Johnson, St. Mary's; E. G. Jones, Wales and London; J. E. Jones, Liverpool; W. W. Jones, Guy's; M. Kamal El Din, Birmingham; B. S. Kaushal, M.B. Punjab, Cardiff; W. W. B. Kelly-Wiseham, Middlesex; R. G. Knight, Camb. and Guy's; W. S. Larcombe, Guy's; J. A. E. Lawn, St. Bart.'s; Gladys A. R. Lenanton, Royal Free; S. Levontin, London; R. S. Lewis, Camb. and St. George's; T. E. S. Lloyd, Camb. and St. George's; D. P. Lockhart, St. Thomas's; H. A. Lockhart, Durham; Barbara R. Lockwood, Royal Free; J. F. Lown, Camb. and St. Bart.'s; J. Lubran, Guy's; M. J. F. McArdle, Guy's; J. J. McCann, St. Thomas's; M. J. McCormack, London; R. G. Macfarlane, St. Bart.'s; H. A. Magnus, St. Bart.'s; V. S. Majmudar, M.B. Bomb., Birmingham; C. G. Malkani, M.B. Bomb., St. Bart.'s; J. I. Maran, Univ. Coll.; J. R. M. Martin, St. Bart.'s; A. G. C. Mason, Middlesex; J. B. Maurice, St. Mary's; J. Metcalf, London; G. A. Miller, Camb. and Guy's; F. C. Moll, Westminster; G. R. Morgan, St. Bart.'s; R. B. Munro, Univ. Coll.; Alice M. Naish, Camb. and Royal Free; N. J. S. Nathan, Charing Cross; R. W. Nevin, Camb. and St. Thomas's; Elizabeth M. Ogden, King's Coll.; G. H. C. Ovens, St. Mary's; J. W. M. Owen, St. Mary's; M. W. L. Owen, Camb. and St. Mary's; W. M. Oxley, St. Bart.'s; C. S. Patel, M.B. Bomb., A. J. Pengiaze, St. Mary's; B. J. Philbin, Manchester; R. W. Pickering, Guy's; S. H. B. Platts, Camb. and Leeds; G. A. Powell-Tuck, Birmingham; R. R. Race, St. Bart.'s; S. Rameshwar, M.B. Lucknow; G. R. C. Rayner, Guy's; E. N. Rees; Cardiff; R. W. Riddle, Durham; M. Ripka, London; L. O. Roberts, St. Bart.'s; M. L. Rosenheim, Univ. Coll.; E. B. Rotherham, London; F. W. Shepherd, St. Bart.'s; S. M. Silverstone, Camb. and Guy's; I. Singh, M.B. Punjab, London; S. F. Smith, St. Thomas's; S. B. Smith, Guy's; V. C. Snell, St. Bart.'s; Charlotte M. H. Sparrow, Royal Free; J. Stern, London; S. C. Suggit, Univ. Coll.; F. Summers, King's Coll.; R. Sykes, Manchester; Annie C. Taylor, Camb. and Univ. Coll.; W. S. Tegner, Oxf. and London; Jessie A. Thirtle, Royal Free; D. H. H. Thomas, Westminster; H. B. Thomas, St. Thomas's; Greta Traub, King's Coll.; E. Troensegaard-Hansen, Charing Cross; J. M. Vaizey, London; C. B. M. Warren, St. Bart.'s; W. H. C. Watson, Camb. and St. Thomas's; G. D. Wedd, St. Bart.'s; D. Whittaker, Camb. and St. Thomas's; R. F. Winckworth, St. Thomas's; and C. W. Wollaston, St. Thomas's.

Pathology.—G. Abbey, Leeds; H. J. B. Atkins, Guy's; Monica H. Austin, King's Coll.; K. S. Ayyar, M.B. Madras, Middlesex; R. H. Bailey, Camb. and King's Coll.; V. H. Barnett, Univ. Coll.; A. A. W. Beach, L.D.S. Eng., Birmingham; R. H. Berry, Univ. Coll.; J. D. H. Bird, King's Coll.; M. S. W. Bisdee, St. Mary's; R. Biswas, M.B. Calcutta, Univ. Coll.; A. Bowen-Davies, Camb. and Guy's; T. Bromberg, St. Mary's; R. H. Brown, Camb. and Westminster; L. I. S. Campbell, Guy's; W. M. Capper, St. Bart.'s; B. Cates, St. Bart.'s; E. M. Clark, St. Bart.'s; C. A. Clarke, Camb. and Guy's; K. R. D. Coles, Gdy's; G. H. Cooray, Univ. Coll.; J. Cunard, Guy's; Anna V. K. Cyriax, Univ. Coll.; Phyllis E. Dain, Birmingham; W. H. D. Davies, St. Bart.'s; E. A. Devenish, Univ. Coll.; D. C. De Wet, St. Thomas's; L. Dexter, St. Bart.'s; E. M. Eggleton, Univ. Coll.; G. J. Evans, Guy's; Q. F. Evans, St. Thomas's; T. Foulds, Manchester; D. H. Fulton, King's Coll.; A. H. Galley, King's Coll.; D. W. Geidt, Oxf. and Guy's; W. G. Gill, Camb. and Guy's; L. Greenfield, London; E. N. Hailey, Birmingham; O. S. Heyns, Univ. Coll.; A. W. J. Houghton, St. Bart.'s; J. H. Hudson, Leeds; A. D. Iliff, St. Bart.'s; Ursula Y. im Thurn, Univ. Coll.; D. K. Jardine, St. Bart.'s; Ruby D. Johnson, Oxf. and Univ. Coll.; R. L. Kennedy, St. Mary's; S. H. Kessler, King's Coll.; J. A. E. Lawn, St. Bart.'s; S. B. Levy, Liverpool; R. S. Lewis, Camb. and St. George's; W. Lewis, Camb. and Guy's; T. E. S. Lloyd, Camb. and St. George's; D. B. McGavin, M.B. Camb., St. Bart.'s; Mary A. McKean, Royal Free; J. D. Macleod, St. Thomas's; H. A. Magnus, St. Bart.'s; I. R. W. Merrick, King's Coll.; G. F. Metcalf, Leeds; R. B. Munro, Univ. Coll.; J. B. C. Murdoch, Camb. and Guy's; K. H. Nassif, Royal Free; N. J. S. Nathan, Charing Cross; R. W. Nevin, Camb. and St. Thomas's; H. E. Offord, St. George's; G. H. C. Ovens, St. Mary's; E. D. Page, St. Mary's; R. Parkinson, London; R. V. Payne, Camb. and Guy's; R. S. Pepperdine, Manchester; R. W. Pickering, Guy's; H. J. M. Robinson, Camb. and St. George's; A. C. Rumsey, Camb. and London; R. H. Rushton, King's Coll.; B. F. B. Russell, St. Bart.'s; B. Samuel, Cardiff; S. B. H. Saunders, St. Bart.'s; E. F. Scowen, St. Bart.'s; V. M. Seifert, London; B. Shanovitch, London; S. C. Shore, Guy's; Frances E. Smart, Birmingham; V. C. Snell, St. Bart.'s; S. C. Suggit, Univ. Coll.; C. M. Vaillant, Oxf. and Liverpool; H. B. D. Vaughan, St. Bart.'s; and Albertine L. Winner, Univ. Coll.

Royal College of Physicians of London.

On Feb. 4th licences to practise were conferred upon 37 candidates (35 men and 2 women) who have completed the Final Examination of the Conjoint Board, and have complied with the by-laws of the College. This list is supplemental to that printed in our last issue. The following are the names and medical schools of the successful candidates, viz.:—

J. H. B. Beal, Oxford and St. Bart.'s; H. L. Beckitt, London; F. J. Beilby, Camb. and St. Bart.'s; H. W. Boake, Camb. and St. Thomas's; J. A. Boycott, Oxford and Univ. Coll.; H. T. L. Broadway, St. Thomas's; S. B. Bromberg, St. Mary's; R. H. P. Clark, London; J. G. R. Clarke, St. Thomas's; I. Cohen, King's Coll.; T. R. S. Cormack, Camb. and London; E. H. de B. Crowther-Smith, Guy's; J. F. Dales, Univ. Coll.; G. A. Desai, L.M.S. Bombay, London; R. D. Green, London; K. H. C. Hester, London; W. Holdsworth, St. Bart.'s; E. T. Jones, Cardiff and London; K. D. Keele, St. Bart.'s; W. S. G. Lawson, St. Thomas's; P. H. Lomax, Guy's; I. A. MacDougall, Guy's; G. J. McFarlane, St. Thomas's; N. C. O'Byrne, St. Thomas's; Norah W. K. Petter, Royal Free; F. W. J. Platts, Camb. and King's Coll.; C. R. D. Porter, Middlesex; T. W. H. Porter, Oxford and Middlesex; K. C. Priddy, London; Pushpawati, Punjab and Royal Free; J. A. E. Scott, Oxford and Middlesex; J. R. S. Sharp, Guy's; R. H. Smith, Camb. and St. Thomas's; G. L. Talwar, Punjab and St. Thomas's; J. C. S. Thomas, St. Bart.'s; A. A. M. Wajih, Bengal and Charing Cross; and G. Walker, London.

Royal College of Physicians of Edinburgh.

At a quarterly meeting of the College on Feb. 2nd, with Dr. Robert Thin, the President, in the chair, Dr. James Douglas Allan Gray (Liverpool), Dr. John Gibb McCrie (Edinburgh), and Dr. Douglas Nairn Nicholson (Edinburgh) were introduced and took their seats as Fellows of the College. Dr. James Waters Thornton Patterson (Droitwich), Dr. Jacobus Johannes de Waal (Johannesburg), and Dr. William Lindsay Lamb (Aberdeen) were elected to the Fellowship.

Prof. K. F. Wenckebach, of Vienna, was appointed the George Alexander Gibson lecturer for 1932. Dr. James Crooks and Dr. Henry Joseph Rodway Kirkpatrick were awarded the Kirk Duncanson Fellowship for Medical Research, for one year. Lieut.-Colonel John Morison, I.M.S., was awarded the Parkin prize for the best essay on the curative effects of carbonic acid gas or other forms of carbon in cholera, the different forms of fever, and other diseases.

London Inter-Collegiate Scholarships Board.

The Board announces that an examination for 14 medical scholarships and exhibitions, and one dental scholarship, of an aggregate total value of £1483, will begin on May 23rd. They are tenable at University College and University College Hospital Medical School, King's College and King's College Hospital Medical School, the London (Royal Free Hospital) School of Medicine for Women, and the London Hospital Medical College. Full particulars and entry form may be obtained from the secretary of the Board, Mr. S. C. Ranner, the Medical School, King's College Hospital, Denmark-hill, S.E.5.

National Conference on Leprosy in China.

We are informed that the first national conference on leprosy in China will be held in Shanghai on April 14th and 15th, under the auspices of the Chinese Mission to Lepers. The first day will be devoted to an appraisal of the leprosy position in China, and to discussions on the methods most applicable to the special conditions in that country. The second day will be given to the consideration of problems of diagnosis and treatment. No special invitations are being sent out, but it is hoped that leprologists from other countries will take part in the discussions.

Brighton County Borough Mental Hospital.

On Feb. 6th, the Mayor of Brighton opened an admission hospital in connexion with the larger institution at Haywards Heath. There had been hopes of finding a suitable site for building in the grounds of the Mental Hospital, but the adjoining estate of Beechmont, a house of Georgian type with 27 acres, came into the market, and it was purchased by the Brighton Corporation upon the strong recommendation of the medical superintendent, Dr. G. H. Harper-Smith, and the Board of Control, need for relieving a certain amount of overcrowding in the main hospital having long been insistent. The purchase price for the estate was £9225; £5400 has been spent on its adaptation, and about £2600 on its furnishing. There is accommodation for 50 female patients at weekly payments ranging from three to ten guineas.

Hunterian Society.

The Hunterian Oration will be delivered by Dr. J. B. Christopherson at the Apothecaries' Hall, Water-lane, London, E.C., at 9 P.M. on Thursday, Feb. 25th. His subject will be the Ætiology of Chronic Bronchitis.

Royal Statistical Society.

Prof. Major Greenwood, F.R.S., will give an address to this society at 5.15 P.M. on Tuesday, Feb. 16th, in the hall of the Royal Society of Arts, John-street, Adelphi, London, W.C. His subject is the Quantity and Quality of Official Statistical Publications.

The Marie Curie Hospital.

The first endowed bed at this hospital was dedicated last week by the Bishop of Exeter, representing the women of Devon who have subscribed £2000 for the purpose. The first occupant came from Plymouth, the bed being intended for the free treatment of Devonshire women.

Subscription Benefits at King's College Hospital.

At a dinner in aid of this hospital last week Lord Gorell explained a scheme for attracting new subscribers. A subscription of £1 by a single person, £1 10s. by a married couple, and £2 by married persons with children will give the right during the year to three weeks' in-patient maintenance and treatment.

London School of Hygiene and Tropical Medicine.

The Langley prize, which is usually awarded every three years for the best paper submitted by officers of the West African Medical Service—whether on the active or retired list—has been awarded by the School in equal shares to Dr. E. C. Smith, for his paper, A Dermatological Atlas of Nigeria, and Dr. Hope Gill, for his paper on Diagnostic Methods in Human Trypanosomiasis.

University of Durham College of Medicine.

The second of a series of lectures on Recent Advances in Physiology applicable to Medicine will be given at this College, Newcastle-upon-Tyne, at 4.45 P.M., on Friday, Feb. 19th. The lecturer will be Dr. J. J. R. Macleod, F.R.S., regius professor of physiology in the University of Aberdeen, and the subject Diabetes as a Physiological Problem. Medical practitioners are invited to attend.

Tuberculosis Association.

At a meeting of this association, to be held at Oxford from March 17th to 19th, the principal subjects of discussion will be Chronic Pulmonary Suppuration and its Treatment by Bronchoscopy and Drainage (Dr. A. S. Scott Pinchin and Dr. H. V. Morlock), Selective Lung Collapse in Bilateral Disease (Dr. F. Gravesen), and the Ætiology and Treatment of Spontaneous Pneumothorax (Dr. L. S. T. Burrell). The hon. secretary of the association is Dr. G. T. Hebert, of St. Thomas's Hospital, London, S.E. 1.

Royal Medical Benevolent Fund.

At the meeting held in January the committee voted 78 grants amounting to £1844. The following are particulars of a few cases helped:—

M.R.C.S., aged 62. One daughter aged 9. Applicant had to retire in 1929. He is suffering from chronic nephritis. He has had a number of cerebral attacks, culminating in a hæmorrhage which has caused paralysis. He can barely walk, and he is mentally incapable of any work. By the time he retired the practice had deteriorated and was unsaleable. The applicant and his wife are living on a pension of £87 10s. a year. The daughter's school fees have been arranged for. Fund voted £40 in four instalments, and other societies are being approached to coöperate with this case.

Widow, aged 53, of L.R.C.P. Husband died in 1927. The applicant suffers from cardiac condition and gall-stones, and is totally unfit for any employment. Her eldest daughter, aged 30, is paralysed and mentally affected, so that she requires constant care and attention. The youngest daughter is delicate. The son, aged 22, is a junior clerk. His salary is £80 a year, and he contributes £24 to assist his mother. The applicant's income is £90 a year. Fund voted £26, in four instalments, and will seek the help of other charities for this unfortunate family.

Widow, aged 67, of M.D. The applicant's husband was in receipt of an annuity of £40 from this Fund, and a Government pension which ceased at his death in 1932. The widow is left penniless. It is hoped that some reduced pension may be obtained from the Government for the widow. Fund voted £26 in four instalments.

Widow, aged 55, of L.S.A. Husband died after a few days' illness in November, 1931, at the age of 63. When the practice and house are disposed of, it is expected that there will be nothing left from the estate, for there is a mortgage to be paid off and debts to settle. There is a daughter, aged 14½. The only son, aged 30, a married man, is surgeon in one of H.M. Services stationed abroad, with a salary of £400 a year, and is at present allowing his mother £10 a month. Fund voted £26. The Ladies' Guild of the Royal Medical Benevolent Fund will assist in the education of the daughter.

Cheques should be made payable to the hon. treasurer of the Fund, 11, Chandos-street, Cavendish-square, London, W. 1.

Inquiry into Mental Deficiency.

The Minister of Health received a deputation on Feb. 9th from the County Councils Association, the Association of Municipal Corporations, and the Mental Hospitals Association on the subject of the sterilisation of mental deficients. They represented that while the associations for which they spoke had reached no final conclusion upon the desirability of sterilising mental deficients, they considered that the time had come at which a full inquiry should be made into the whole question. The Minister said that he agreed that there was a need for inquiry, and he proposed, as a first step, to arrange for inquiry to be made by competent persons into its scientific aspects.

Dentistry and National Health.

The Brighton and Hove Provident Dental Hospital has just removed to new quarters at 7, Buckingham-road, Brighton, and was formally opened on Feb. 5th by Sir Norman Bennett. After pointing out that the bearing which the teeth had on the general health had been increasingly appreciated of late years, Sir Norman said that what was wanted particularly now was some sort of service for adolescents between school-leaving age and the age at which they qualified for insurance benefits; for when children left school they got out of the habit of having their teeth regularly inspected. The present system of national dentistry might be summarised broadly as a fairly efficient, but lamentably weak, school service, a period of almost compulsory neglect, a further period of voluntary neglect, concluding with a short, intensive, and drastic course of treatment in middle or advanced age. Sir Norman expressed his sympathy with the hospital because it gave dental treatment to those who could not pay for it, or could only pay a little, and was prepared to give a similar service to wage-earners, with incomes below a certain limit, in return for weekly payments throughout the year under the Sussex Provident Scheme.

Appointments

BAND, D., M.B., Ch.B. Edin., F.R.C.S. Edin., has been appointed Assistant General Surgeon, Hospital for Diseases of Women, Edinburgh.

POOLER, H. E., M.B., Ch.B. St. And., Hon. Anæsthetist, Chesterfield Royal Hospital.

TAYLOR, DOROTHY M., M.B., Ch.B. Edin., Maternity and Child Welfare Officer, Sunderland Council.

THOMAS, OLIVER F., L.R.C.P. Lond., M.R.C.S., D.P.H., Tuberculosis Officer, Sunderland Council.

Births, Marriages, and Deaths

BIRTHS.

BEATSON.—On Feb. 2nd, at Grey Friars, Hutton Mount, Brentwood, Essex, the wife of Major B. Fraser Beatson, I.M.S. (ret.), of a son.

CAWTHORNE.—On Feb. 3rd, at Welbeck-street, W., the wife of Terence Cawthorne, F.R.C.S., of a son.

MARRIAGES.

TYLECOTE—PHYTHIAN.—On Feb. 6th, at Hitchin, Frank Edward Tylecote, M.D., F.R.C.P. Lond., Professor of Systematic Medicine in the University of Manchester, to Mable Phythian, Ph.D., late Warden of the Elvington Settlement, Kent.

DEATHS.

BROOK.—On Feb. 6th, at Mundesley, Norfolk, Samuel Stanley Brook, M.R.C.S., L.R.C.P., aged 46.

DAVIS.—On Feb. 4th, in a nursing home, London, Arthur Randall Davis, M.R.C.S., of Oaklands, Hythe, in his 77th year.

LILLIES.—On Feb. 5th, at Ashley-gardens, S.W., Arthur Chudleigh Lillies, son of the late George William Lillies, M.D., aged 73.

RAINSFORD.—On Feb. 4th, at Oak Lodge, Rolle-road, Exmouth, Colonel W. J. R. Rainsford, C.I.E., L.R.C.P.I., F.R.C.S.I., aged 80 years.

REBOUL.—On Feb. 4th, at Cannes, very suddenly, Dr. A. E. Reboul, L.R.C.P. Edin., M.D. Mont., of Châtelguyon and Cannes, aged 58.

SINCLAIR.—Suddenly on board M.V. *Reina del Pacífico*, Thomas Walker Sinclair, M.D., D.P.H., late Medical Officer of Health, Melbourne, Australia.

WILLIAMS.—On Feb. 2nd, very suddenly, Dr. Robert Stenhouse Williams, M.B., C.M., D.Sc., Director of the National Institute for Research in Dairying, University of Reading.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 16th.—5.30 P.M., GENERAL MEETING OF FELLOWS: Ballot for election to the Fellowship. 8.30 P.M., PATHOLOGY: Papers: R. M. FRY: The Isolation of Organisms in the Presence of *B. proteus*. R. J. V. Pulvertaft: Experiments in Rabbits with the Toxins of the Hæmolytic Streptococci. J. A. Murray: Mesenteric Metastases of the Rous I. Fowl Sarcoma. Spindle-celled Tumour with Prickle-cell Carcinomatous Metastasis. The Structure of the Gizzard. F. R. Selbie: Experiments on the Tomato-juice Sarcoma of Rats.

THURSDAY.—5 P.M., DERMATOLOGY (Cases at 4 P.M.). Short Paper: Dr. H. Windsor Wade (Culion Leprosy Settlement, Philippine Islands): Tuberculous Leprosy. Cases: Dr. H. W. Barber: 1. Telangiectasia macularis eruptiva perstans (Parkes Weber). 2. Acanthosis nigricans: forme fruste. Dr. G. B. Dowling with Dr. L. Forman: 3. Fox Fordyce Disease. Dr. J. M. H. MacLeod: 4. Acne Scrofulosorum. 5. Case for diagnosis. Dr. W. N. Goldsmith: 6. Bowen's Disease with Prickle-celled Carcinoma and Associated with Psoriasis. Other cases will be shown. 8.30 P.M. NEUROLOGY. Short Papers: Dr. C. P. Blacker: Human Pedigrees. Dr. J. le F. Burrow: The Phenomena of Regeneration in Peripheral Nerves After Suture. Dr. Ranyard West: Curare in Man.

FRIDAY.—5.30 P.M., PHYSICAL MEDICINE. Paper: Dr. T. G. Kahlmeter (Stockholm): Modern Physiotherapeutic Measures. 8.15 P.M., OBSTETRICS AND GYNÆCOLOGY. Discussion: Gonorrhœa and Other Cervical Discharges. Opener: Colonel L. W. Harrison (St. Thomas's Hospital). 8.30 P.M., RADIOLOGY. Discussion: X Ray Treatment of Non-malignant Conditions. Short Papers: Dr. Russell Reynolds: 1. The X Ray Treatment of Mastitis and Certain Leukæmias. Dr. S. Gilbert Scott: 2. Recent Advances in the Treatment of Rheumatism and Asthma. Informal discussion on general subjects will follow.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland-place, W.

THURSDAY, Feb. 18th.—8.15 P.M., Dr. C. C. Chesterman: Some Results of Tryparsamide and Combined Treatment of Gambian Sleeping Sickness. (Demonstration at 7.45 P.M.)

CHELSEA CLINICAL SOCIETY, Hotel Rembrandt, Thurloe-place, S.W.

TUESDAY, Feb. 16th.—8.30 P.M. (preceded by dinner at 7.30). Discussion on Medical Evidence in Criminal Cases. (To be opened by the Master of the Rolls and Sir William Willcox.)

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, W.C.

FRIDAY, Feb. 19th.—5 P.M., Discussion on Rheumatism in the School Child. (To be opened by Dr. Gerald Slot, Dr. Francis Bach, and Dr. Vincent Coates.)

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.

FRIDAY, Feb. 19th.—5 P.M. (at 11, Chandos-street, W.), Dr. William Moodie: The Significance of Abnormal Behaviour in Children.

ROYAL INSTITUTION, 21, Albemarle-street, W.

THURSDAY, Feb. 18th.—5.15 P.M., J. B. S. Haldane: Heredity in Man.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

THURSDAY, Feb. 18th.—5 P.M., Prof. Cyril Okell: The Rôle of the Hæmolytic Streptococci in Infective Disease. (First Croonian lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, Feb. 15th.—4 P.M., Mr. Wilfred Trotter: The Hunterian Oration.

WEDNESDAY.—5 P.M., Prof. Le Gros Clark: Structure and Connexions of the Optic Thalamus. (Arris and Gale lecture.)

FRIDAY.—5 P.M., Prof. Le Gros Clark (lecture continued).

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, Feb. 15th, to SATURDAY, Feb. 20th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Wed., 4 P.M., Mr. P. Lockhart Mummery: Lantern Demonstration, Diagnosis and Treatment of Diverticulitis.—EAST LONDON HOSPITAL FOR CHILDREN, Shadwell. Tues., Demonstration by Dr. Leonard Findlay, at 3 P.M.—METROPOLITAN HOSPITAL, Kingsland-road, N. Thurs., Demonstration by Mr. C. Naunton Morgan, at 2 P.M.—PRINCE OF WALES'S HOSPITAL, Tottenham, N. All-day course in Medicine, Surgery, and the Specialties, 10.30 to 5.30 P.M.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Fri., Demonstration by Prof. Dame Louise McIlroy, at 5 P.M. Further particulars from the Fellowship of Medicine.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Feb. 15th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Disseminated Sclerosis and Allied Conditions.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Martin: Diseases of the Vertebral Column with Nervous Symptoms.

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Cerebral Scleroses of Childhood.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Cerebral Tumours.

GUY'S HOSPITAL, London Bridge, S.E.

MONDAY, Feb. 15th.—5 P.M., Dr. A. E. Barclay: The Use of X Rays in Physiological Investigation.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Feb. 16th.—3.15 P.M., Mr. F. Roques: Pregnancy in Association with Tumours.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, Feb. 17th.—4 P.M., Dr. W. E. Gye: Cancer.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.

THURSDAY, Feb. 18th.—5.30 P.M., Dr. H. C. Lucey: Pathology of Pregnancy.

ST. PETER'S HOSPITAL, Henrietta-street, W.C.

WEDNESDAY, Feb. 17th.—3 P.M., Mr. R. Ogier Ward: The Investigation of Hæmaturia.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, Feb. 18th.—4.30 P.M., Mr. E. T. C. Milligan: Pruritus Ani.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, University-street, W.C.

TUESDAY, Feb. 16th.—5.15 P.M., Prof. A. E. Boycott: Hypertrophy and Atrophy.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.

SUNDAY, Feb. 14th.—10.45 A.M., Dr. R. A. Hickling: The Differential Diagnosis and Treatment of Breathlessness. 11.45 A.M., Dr. S. C. Shanks: X Ray Diagnosis in Urinary Conditions.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.

THURSDAY, Feb. 18th.—9 P.M., Dr. J. L. Livingston: Bronchiectasis—Its Prevention and Treatment.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.

TUESDAY, Feb. 16th.—5 P.M., Dr. M. Sydney Thomson: Lupus Erythematosus.

THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham.

WEDNESDAY, Feb. 17th.—2.30 P.M., Dr. A. Salway: Visit to Oxo, Ltd.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Feb. 19th.—4 P.M., Mr. H. Kisch: Treatment of Cancer of Throat, Nose, and Ear by Radium.

CHADWICK LECTURE.

THURSDAY, Feb. 18th.—5.15 P.M. (at the Medical Society of London, 11, Chandos-street, W.). Dr. J. D. Rolleston: Sir Benjamin Ward Richardson, his Life and Work (illustrating epidiascope).

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.

THURSDAY, Feb. 18th.—8 P.M., Prof. M. S. Pembrey and others: Influence of Muscular Work on the Passage of Food through the Stomach of Man. Dr. A. G. C. Taylor: Action of Radium D, E, and F with Colloidal Bismuth upon Growing Tumours. Mr. W. J. Rees and Mr. L. H. Clark, Ph.D.: Quantity and Significance of the Scattered Radiation produced in Water Subjected to Beams of X Rays and Gamma Rays.

FRIDAY.—2 P.M., Mr. Philip Franklin and Dr. A. Orley: Demonstration of Lipiodol Bronchography by the Nasal Route.—5 P.M., Cases for discussion.—5.30 P.M., Dr. F. Hernaman-Johnson: Experiments on the Projection of the Sphenoidal Sinuses through the Orbit. Dr. S. L. Mucklow: Relief of Pain in Rheumatoid Arthritis and Myositis Ossificans by Ray Therapy.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Feb. 17th.—4 P.M., Dr. A. R. Neligan: Organisation of Treatment for Industrial Rheumatism.

NATIONAL COUNCIL FOR MENTAL HYGIENE.

WEDNESDAY, Feb. 17th.—5.30 P.M. (at 11, Chandos-street, W.), Dr. T. S. Good: Crime and Mental Abnormality.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Feb. 19th.—4.15 P.M. (at the Whitworth-street West Hospital), Mr. Morley: Birth Injuries and Their Treatment.

FACULTY HALL, St. Vincent-street, Glasgow.

TUESDAY, Feb. 16th.—4 P.M., Prof. A. Young: Surgical Treatment of Minor Infections.

VICTORIA INFIRMARY, Glasgow.

WEDNESDAY, Feb. 17th.—4.15 P.M., Mr. R. Tennent: Surgical Cases.

NOTES, COMMENTS, AND ABSTRACTS

SOME COMMENTS ON THE CONSCIOUS MIND.*

BY ALEX. W. HENDRY, M.D. ABERD., M.R.C.P. LOND.,
ASSISTANT PHYSICIAN, ABERDEEN ROYAL INFIRMARY.

IT is perhaps permissible to doubt the wisdom of some prevalent tendencies in psychology. Previously metaphysicians considered consciousness a fundamental condition of all intelligence, and an invariable component of mental action. Present day psychologists would have us believe that most of our mental life is lived in the subconscious. If this be true, if such a state of affairs really exists, then it bodes ill for enlightened endeavour and progressive human advancement.

The subconscious mind has been enthusiastically studied—studied with an intensity which has destroyed the perspective and disturbed the general view of the mental field. It has become but a synonym for the devils and demons of the dark ages. The subconscious is charged with the harbouring of complexes which bring about serious mental discord and ill-health. These complexes may cause paralysis, anæsthesias, obsessions, amnesias, phobias, fits, and fugues. They chase happiness away, and bring untold misery and sadness to whomsoever may possess them. It would appear to be the teaching of the present, that the door to mental harmony lies in the subconscious mind. Have we no key to that door? Can we consciously and deliberately unlock the door? Or has the subconscious locked it against us?

An extensor plantar reflex occurs in, but is not due to a lesion of, the lower motor neurone. It is due to a loss of pyramidal influence. So the vagaries of neurotics are not due to any essential abnormality of the subconscious, but are phenomena associated with lack of higher control. In neurotic cases there is default in conscious mental processes. The unwelcome matter is sidetracked. It never really comes before the highest consciousness, and therefore, its associations are confined to subconscious realms. The "complex" is the result of default, and this default must necessarily be the essential factor in the production of neurotic states. In normal people the default is subject to correction by directive consciousness. The process of repression may be unwitting, but not, it is submitted, outside conscious control. Failure to face unpleasant facts is a weakness of the conscious mind. Normal people must face unacceptable affects, because if such are not consciously faced then repression definitely occurs.

It is noteworthy that Freudians find in all neurotic states evidence of repressed sexuality. These findings are not very convincing. It would be difficult to attribute war neurosis or railway spine to sexual complexes. Human beings have many interests, and while it is true that in psychopathic states of civil life, repressed sexuality is a very important factor, nevertheless, there are other affective states which, if incompletely mentalised, result in neurosis. Sexual complexes have nothing whatsoever to do with a great many cases. Another point is doubtful—Freudians trace complexes back to infantile life. These infantile complexes revealed by psychoanalysis are not in themselves causatively connected with adult neurosis except by regression. In cases of recent origin there has been either a mental deterioration or a new situation which cannot be adequately faced. Where no mental deterioration has occurred some present maladaptation exists—a lack of directive conscious ability for appropriate reaction. The infantile complex in these cases is but a regression, a revitalisation by transference of affect. Many psychopathic states traced to infantile sexual repression are due, not to these infantile complexes, but to a present maladaptation.

Some people there are who spend the major part of waking life in the subconscious. They are awake and yet they sleep. Their actions result from primitive impulses which are not understood, not judged, and not inhibited. Their actions are thus not moulded by the highest critical mental faculties. Perhaps most people are somehow partially cognisant of the true and real reasons for their actions, but few indeed are fully aware of the nature of their impulses, their source or their reason. Few people subject these impulses to the full scrutiny of their critical faculties, so that their final actions may be fully conscious, deliberate, and defined. Such people know themselves. The fuller the consciousness of daily life, the greater the degree of culture, the higher the grade of civilisation. As yet the integration of primitive and highest mental faculties is incomplete. Minds are not fully developed. Man himself must consciously and deliberately accomplish this. He must expand his realism to include his subconscious, only thus is the fullest consciousness possible. Further, mental evolution is likely, but this evolution must be deliberate, directive, and conscious. Man must evolve his own mind.

The division between the conscious and subconscious has been termed a "psychic filter." It is more like a barrier—a movable barrier which recedes as the conscious realm is enlarged. We must penetrate the dark areas, we must switch the mental floodlight from our environment right about into the dark recesses of our minds, and this is possible and is called "introspection." It is not for a moment suggested that children and juveniles are capable of introspection. It is, however, strongly urged that the normal adult would benefit greatly from observation of the inner mental self. The springs of energy should be examined and studied; then only could power be conserved and controlled. Impure springs could be cleansed, wandering streams collected and made to swell the volume of vital energy. Too often is man at the mercy of an all-devouring, harmful mental torrent. This harmful energy can only be harnessed for useful work if pure springs and straying streams are guided into peaceful channels filled with useful energy and quiet harmony. Evolution has brought man to a state of sentiency, and further progress depends on the use of this function. He must, if he would further improve, examine carefully and thoughtfully the mental springs, and he must consciously and deliberately direct their route. More consciousness is required, indeed a superconsciousness is requisite, and this is what we must strive to acquire.

Introspection will bring knowledge and knowledge will bring power, so that in the end man may be able to say truly, "I am the Captain of my Soul, the Master of my Fate." Cultivate then this all-pervading all-knowing consciousness. Know thou thyself. Let no mental ripple escape your consciousness, then you need never fear the subconscious and its terrors.

* Substance of lecture delivered before the Aberdeen University Medical Society on Nov. 13th, 1931.

CONTROL OF MALARIA.

AT a recent meeting of the industrial antimalarial advisory committee of the Ross Institute, the formation of an Assam branch was reported, and Dr. G. C. Ramsay gave an account of the work that was being done to prevent malaria on tea estates in Assam and Bengal. A fifth research centre was, he said, being opened during the year. It was also announced that Dr. Ramsay had completed researches into the best oils for antimalarial mixtures and was now in touch with the Burma Shell Group with a view to making a standard efficient mixture available at all the oil

depôts in India. A standard mixture for South Africa and Rhodesia had been established.

Mr. P. J. Parker, of the Roan Antelope Copper Mines, Rhodesia, testified to the remarkable results of the work of the Institute there; a large community of some 1800 Europeans and 12,000 natives were now practically free from malaria, mosquito nets were no longer necessary, hardly anybody took quinine, and the social status of the mines had undergone a complete change as the best type of white miner came freely. Sir Malcolm Watson said that he was leaving for a second tour of inspection, for he would not be satisfied by anything less than complete success. Despite the reduction of malaria to less than 5 per 1000 among white people, about 40 per cent. of the 1500 native children were infected, and these he hoped to cure. Sir Malcolm thought that, although Paris green might have a place in malaria control, it was not a substitute for oiling, since it allowed the female mosquito to alight anywhere and lay her eggs in perfect safety. It was quite incorrect to say that it was impossible to control malaria by antilarval measures alone; the disease had been practically stamped out, for example, in the Malay town of Klang without the use of a single grain of quinine. At the same time it was the duty of workers to cure the sick and particularly the children. He was taking two new drugs to Africa for experiment, for some of the results with plasmoquine had been disappointing.

Similar reports of success in stamping out malaria were brought from East Africa, South Africa, and Italy, illustrating the value of the work of the Institute to the commercial and industrial world.

STERILISATION OF THE TYPHOID CARRIER BY OPERATION.

FOR several years the problem of the typhoid carrier has been systematically studied at Gade's Pathological Institute in Bergen, the staff of which is making a survey of typhoid carriers over a large section of the west coast of Norway. Earlier communications have now been supplemented by a paper [1] in which Dr. T. M. Vogelsang and Dr. M. Haaland record 15 new cases, thus bringing up the total number of carriers studied by the institute to 14 men and 58 women. The case histories make sad reading; the fate of the typhoid carrier to-day is in one way even worse than that of the leper in the past. For the leper had often his fellow-sufferers as companions, whereas it is not the custom to form colonies of typhoid carriers—though this may be done eventually. Meanwhile what happens? One of the carriers included in the present survey was a widow for whom a cottage on a lonely island was provided by the local authorities. The inevitable happened, and her return to the haunts of her fellow-beings led to the usual crop of new cases, one at least of which was fatal. It is with such a background as this that the most radical operative interference must be judged; and it is encouraging to find in how great a proportion of cases operations on the gall-bladder sterilise the carrier. Among the 27 operations on the gall-bladder performed on carriers in the series under review, there were two at which the condition of the gall-bladder was found to warrant cholecystotomy alone. In one of these cases the carrier state ceased. Among the 25 carriers on whom cholecystectomy was performed, there were as many as 19 definitely cured. There was one death from operation, and another death 18 months later from tuberculosis, the excretion of *Bacillus paratyphosus* B having persisted after the operation. They had secured a footing in the liver in which necrotic tuberculous foci were found. Of the remaining four failures, two were associated with gall-stones, and it is probable that in both these cases the typhoid infection had ascended the biliary passages within the liver. In the remaining two cases the gall-bladder was found to be normal and the bile sterile. Presumably the typhoid bacilli came from some other organ.

[1] Norsk Mag. f. Laegevidenskaben, November, 1931.

Vacancies

For further information refer to the advertisement columns.

Aberdeen City (Fever) Hospital.—Jun. Rs. M.O. £100.

Auckland General Hospital, New Zealand.—Med. Supt.

Birmingham General Hospital.—Res. Surg. Reg. £100–£120 £140.

Bootle General Hospital, Nr. Liverpool.—Cas. O. and H.S.'s. Each at rate of £150.

Bradford Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.

Brighton, Sussex Maternity and Women's Hospital.—Res. H.S. £130.

Charing Cross Hospital, Strand, W.C.—Surg. Reg. £150. Also Obstet. Reg. £100.

Carlisle, Cumberland Infirmary.—H.P., 2nd H.S., and H.S. to Spec. Depts. Each at rate of £155.

Derby, Derbyshire Royal Infirmary.—Cas. O. £150.

Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175.

Dudley, Guest Hospital.—H.S. £200. Also Asst. H.S. £170.

Elizabeth Garrett Anderson Hospital, Euston-road.—Obstet. Asst. £50.

General Lying-in Hospital, York-road, Lambeth, S.E.—Jun. Res. M.O. and Anæsthetist. At rate of £100.

Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. At rate of £150 and £140 respectively.

Hospital for Consumption and Diseases of the Chest, Brompton S.W.—Physician. Also Asst. Physician.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Islington Dispensary, 303, Upper-street, N.—Asst. Res. M.O. £250.

Leeds University.—Lecturer in Experimental Pathology and Asst. Director of Cancer Research.

Leicester Royal Infirmary.—H.S. and H.P.'s. Each at rate of £125.

Liverpool City.—Asst. Tuberculosis O. £500.

Liverpool, Royal Babies Hospital, Woolton.—Res. M.O. At rate of £90.

London Lock Hospital, 91, Dean-street, W.—Surg. Reg. £100.

London Lock Hospital, Harrow-road, W.—Surg. Reg. £100.

Maidstone, West Kent General Hospital.—H.S. £220.

Manchester, Ancoats Hospital.—Two H.S.'s. Each at rate of £100. Also Med. Reg. £50.

Manchester Babies Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Manchester and Salford, Hospital for Skin Diseases.—H.S. At rate of £100.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Margaret-street Hospital, for Consumption, W.—Hon. Asst. Phys.

Metropolitan Hospital, Kingsland-road, E.—Surgeon.

Northwood, Middx., Mount Vernon Hospital.—H.S. £150.

Nottingham General Dispensary, Broad-street.—Res. Surgeon. £250.

Paddington Green Children's Hospital, W.—Hon. Dental S. and Hon. Surgeon to Out-patients.

Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £100.

Richmond Royal Hospital.—Hon. Surgeon.

Rochester, St. Bartholomew's Hospital.—H.P. At rate of £175

Rotherham Hospital.—H.P. £180.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. Surgeon to Ear, Nose and Throat Dept.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Hon. Dental Surgeon.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Ophthalmic Surgeon. Also Hon. Med. Reg.

Salford Royal Hospital.—Gen. Supt. and Sec. £600.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

Sheffield, Jessop Hospital for Women.—H.S. At rate of £100.

Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £100.

Shrewsbury, Royal Salop Infirmary.—Res. Surg. O. £250. Also Cas. O. and Res. Anæsthetist. At rate of £160.

Southern Hospital, Dartford, Kent.—Res. Med. Supt. £1100.

Southern Rhodesia Medical Service.—Asst. and Relieving Govt. M.O. £500.

South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.

South-Western Fever Hospital, Landor-road, Stockwell, S.W.—Res. Med. Supt. £900.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—Orthopædic H.S. £150.

Sudan Medical Service.—Three M.O.'s. Each £E.720.

Tancreds Studentships.—Three Students. Each £100.

Tunbridge Wells and Counties General Hospital.—H.S. £160.

Ventnor, Isle of Wight, Royal National Hospital for Consumption. Sen. Asst. Res. M.O. £400.

Western Dispensary, Rochester-row, Westminster, S.W.—Res. M.O. and Dispenser. £150.

West London Hospital, Hammersmith-road, W.—Hon. Asst. Anæsthetist.

Willesden General Hospital, Harlesden-road, N.W.—Hon. 2nd Radiologist.

Windsor, King Edward VII. Hospital.—Res. M.O. £200.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Kingston (Surrey), and Presteign (Radnor).